Safety Maintenance and Production

EST. 1901 AMERICA'S PIONEER MAGAZINE IN ITS FIELD

FIFTY CENTS APRIL, 1954

SPECIALTY
Safety Products

AO No. 109 Sweatband now in two widths

Production goes UP when sweat stays OUT of worker's eyes! Regular cellulose sponge sweatband (No. 109B) 1¾" wide, now available 1" wide as No. 108B. For workers who wear helmets or hard hats. Both bands are recommended for high humidity and heat. Dip in water and squeeze out before using for best results.

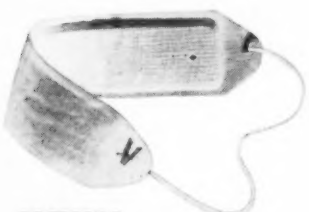
Absorb 16 to 20 times their weight • Model 109B weighs less than ½ oz., 108B even less • Can be washed or sterilized many times • Comfortable, cooling • Reinforced at ends • All rubber adjustable strap

NEW!
No. 851 Dispenser

Combination cleaning-antifog fluid and cleansing tissue dispensing station. Latest, handiest device to keep safety goggles and personal glasses clean and fog free. Magic cleaning-antifog fluid in pressure-packed can goes farther, saves fuss and mess. About 1400 applications per can. Can locked in place by heavy duty steel dispenser to prevent pilferage. Dispenser feeds each sheet 1-by-1 — no waste. Ample space for tissue disposal. Tissues are wet-strength and lint free, size 8" x 4¾".

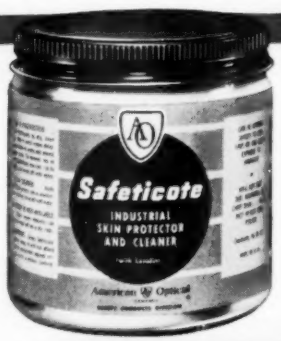
These **AO** **SPECIALTY ITEMS** help keep Men and Production Protected

PLAN FOR THEM IN YOUR SAFETY PROGRAM



NEW!
107B "Thriftiband" Sweatbands

NEW. Cool. Comfortable. Lightweight gauze. Very absorbent. Adjustable elastic headband. Individually wrapped in sealed sanitary, cellophane envelopes. While throw-away type primarily (they're very reasonably priced), they *can* take moderate washing. Tell us your needs.



NEW!
No. 100 "Safeticote" Skin Cream

Cuts absenteeism due to dermatitis . . . protects workers *all day* — washes clean in a jiffy. Safeticote is safe to use on hands, face, neck or arms — contains lanolin. Provides flexible coating between skin and irritants. Protects against cutting oils, lubricants, kerosene, gasoline, solvents, coolants, paints and thinners, carbon tetrachloride, tar and pitch, plastics etc., even poison ivy.

American Optical
SAFETY PRODUCTS DIVISION

Keep your workers in the Safety Zone with American Optical Safety Equipment

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

(For full details, use Key # Q-1 on free Inquiry Card on page 83)

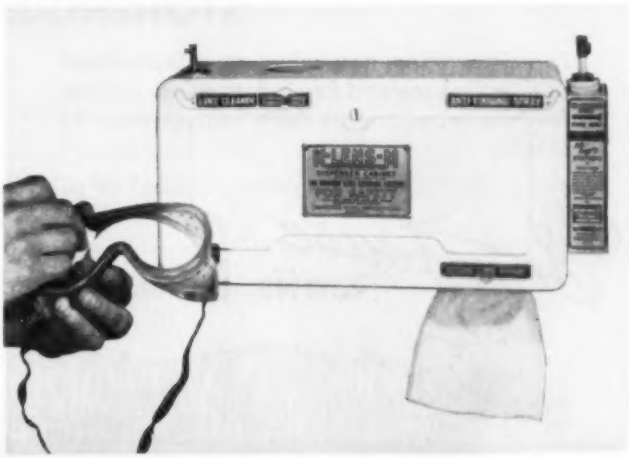
It Takes Foresight TO SAVE EYESIGHT

Factory workers are willing to wear eye-safety goggles which reduce permanent or temporary disfigurement when K-LENS-M Liquid Lens Cleaner and K-LENS-M Anti-Fogging Liquid has eliminated the common excuses that safety glasses are dirty, foggy, smeared or scratched.

Encourage your employees to practice eye-safety by installing efficient and economical goggle cleaning units . . . the K-LENS-M Lens Cleaning and Anti-Fogging Station. This compact unit contains the K-LENS-M Lens Cleaning Liquid; K-LENS-M lint-free lens tissues, with *sanitary* tissue disposal space; and the K-LENS-M Anti-Fogging attachment.

K-LENS-M . . The Acknowledged Leader in the Lens-Cleaning Field

K-LENS-M Liquid Lens Cleaner is the most effective and economical cleaner for both glass and plastic; it cleans quickly and easily with no filming or scratching. K-LENS-M Anti-Fogging Liquid keeps goggles and glasses free of fog for the entire workday. Safety Engineers endorse these K-LENS-M products and leading companies throughout the world use K-LENS-M. *Use K-LENS-M* in your eye-safety program and *see* the results.



THE **WILKINS** CO., INC.

CORTLAND 3, N. Y.

See Booth 57, Greater New York Safety Congress

K-LENS-M Trade-mark registered U. S. & Canadian Patent Offices

(For full details, use Key # Q-2 on free Inquiry Card on page 83)

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FOR INDUSTRIAL ACCIDENT PREVENTION

Most people sometimes forget—and it's a dangerous oversight to forget Safety. "I forgot" is an all too common alibi for an accident.

STONEHOUSE SIGNS

To help workers *remember*, post Stonehouse Safety Slogans and Reminders signs. Just the few words on any of them help to promote safety.

The tendency to forget should not be overlooked—it's serious. Teach your workers to cultivate the practice of safety by reminding them to *remember* its blessings.

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(For copy of catalog, use Key # Q-3 on free Inquiry Card on page 83)

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FORMERLY "SAFETY ENGINEERING"
EST. 1901

VOL. 107, NO. 4 **APRIL, 1954**

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AMERICA'S PIONEER MAGAZINE IN ITS FIELD

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Cool, fresh AIR
in hazardous atmospheres!

Why take chances in explosive atmospheres when you can be assured of perfect safety with the Scott AIR-PAK. Breathe cool, fresh AIR with confidence and comfort.

It goes on and is ready for action in seconds. Just turn on the valve and you're ready to go. No complicated training or practice is necessary.

Other exclusive AIR-PAK features include a large-dial easy to read gage for constant, dependable check of remaining air supply. Cool air absolutely prevents lens fogging. The AIR-PAK is the most economical all-purpose breathing protection available. Operates for as little as 50c per hour with no waste.

For complete information write today!

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SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

217 ERIE STREET LANCASTER, N. Y.

Canada: Safety Supply Co., Toronto — Branches in principal cities
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, New York

(For full details, use Key # Q-4 on free Inquiry Card on page 83)

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New! Stac-Vent

Stops Liquid Splash
Greater Safety
More Comfort

SOFT VINYL-FRAME SAFETY GOGGLE

Model 440SV
Methacrylate Lens
Model 441SV
Acetate Lens

WATCHEMOKET
STAC-VENT
eye SAVERS

. . . a new principle in goggle ventilation

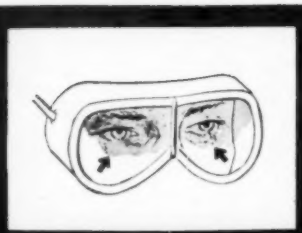
Greater safety . . . No liquid, chemical or other hazard can reach the eye. Ventilation holes are protected under the "Stac-Vent" hood located properly to eliminate lens fogging. Methacrylate or Acetate Lenses and Vinyl frame protect against all hazards: impact, chemical splash, sparks, molten metal.

Safe Ventilation . . . "Stac-Vent" provides draft ventilation at the top and center of the goggle (where warm, moist air normally accumulates). Large openings for ventilation are possible because they are safely shielded by the "hood".

More comfort . . . Soft Vinyl Frame form-fits the face. Goggles are lightweight . . . hug the face without pressure, thanks to soft edge fins which yield to the contours of the nose and face.

Choice of Frames and Lenses . . . Soft Vinyl Frames are available in clear, transparent green or opaque black with STAC-VENT, Regular (Holes) or Screen Ventilation; also no ventilation.
Furnished with clear, light, medium or dark green Methacrylate Lens for heavy impact.
Furnished with clear or medium green Acetate Lens for light impact.

Here's How It Works



Moist air accumulates at top inside of goggle causing inside of lens to fog.

STAC-VENT drafts off hot, moist air from inside goggle just as a chimney carries off smoke.

PLUS ALL THESE FEATURES

Fits over all prescription glasses . . . Extra wide 6" lens and large frame fits over all prescription glasses — metal or horn-rimmed. Soft Vinyl Frame is translucent (except opaque black) for partial side vision. Front of frame protrudes to act as bumper, protecting the lens surface when thrown on table or floor.

Optically correct, shatterproof lenses . . . Eye Savers Methacrylate and Acetate Lenses are guaranteed optically correct. Cannot cause image distortion with resultant permanent injury to the eyes. They are shatterproof — cannot splinter with impact.

Lenses are easily replaceable . . . no special tools or skill is required to replace lenses. Positive Lens Lock Bar is easily removed . . . new lens inserted (soft vinyl frame spreads at finger touch) . . . new Lens Lock Bar (supplied with each replacement lens) is put in place.

See Your Authorized Eye Savers Supplier, or write direct for full Information on the new "Stac-Vent" and other modern Eye Savers

Quality Eye Protective Equipment ***Made by the Leaders in Plastics***

WATCHEMOKET OPTICAL CO., INC.

238 West Exchange St., PROVIDENCE 3, R. I. *In Canada: Levitt-Safety Limited, Toronto 10, Montreal 26*

(For full details, use Key # Q-14 on free Inquiry Card on page 83)

What is this girl doing?

She's helping reduce your accident rate!

You know that accidents cost money. And fifty percent of all accidents are preventable. You know that safety messages *that get read* do help reduce accidents — the National Safety Council says so. But *how* to get them read . . . ?

Put your safety messages in your worker's hand — on an AJAX or AERO Cup — where he'll see them several times a day, when he's relaxed, receptive, ready to read. (And he'll appreciate the comfort, convenience and complete sanitation of these crisp, clean, easy-to-drink-from paper cups.)

AJAX® Cups — one-piece, wedge-shaped, easy to hold and drink from; in 4, 6, and 7 oz. sizes; packed imprinted with assorted stock safety messages or your own message to order.

AERO® Cups — for those who prefer a flat-bottom cup; in 3, 4, 5 and 6 oz. sizes. Also available imprinted with assorted stock safety messages or your own message to order.

GET THE FULL STORY

Write us today for this new folder which gives full details on imprinted AJAX and AERO Cups and equipment.

IT'S WORTH KNOWING

Medical men agree that drinking sufficient water is necessary to health; drinking too little water can produce sluggishness, fatigue and other harmful effects. Surveys show that people drinking from paper cups drink 60% more water, consume less time doing it.

And AJAX and AERO Cups reduce the danger of transmitted infection, help cut absenteeism and improve worker morale, because they provide complete, sanitary, comfortable drinking water service.

C1-8

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General Offices: • Springfield 2, Mass.

15 DIVISIONS FROM COAST TO COAST

(For full details, use Key # Q-6 on free Inquiry Card on page 83)

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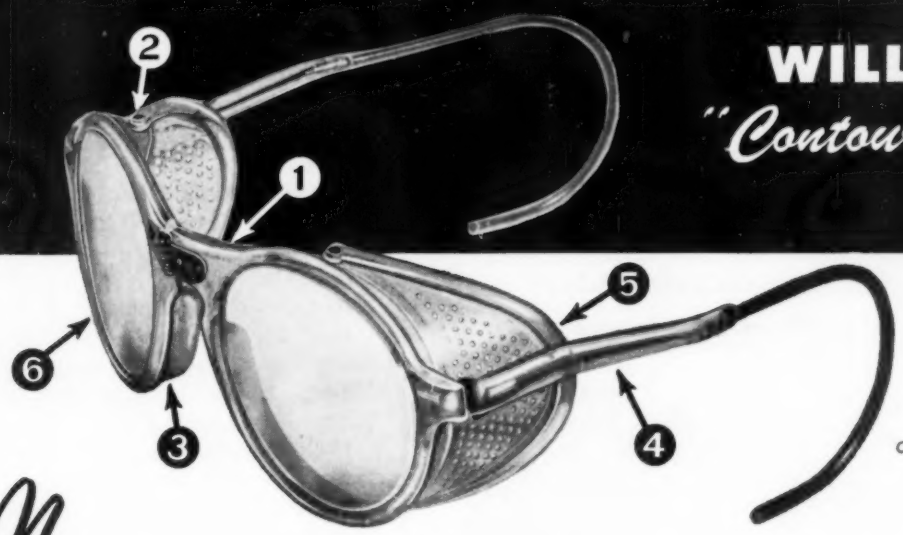
first really new *development in safety spectacles in years!*

WILLSON "Contour-Spec"*



Style WCS47
Covered by Design Patent 168,988

New... hinged bridge gives snug, comfortable fit . . . self-adjusting to *any* facial contour!

1. **New hinged bridge** combines the flexibility of cup-type goggles with the lightweight, compact protection of safety spectacles.

2. **One all-purpose size** permits universal fit. Bridge hinge gives automatic adjustment to any bridge width from 18-26 mm.; one eye size—47 mm.—fits everybody. *No need to stock a variety of bridge and eye sizes.*

3. **Plastic nose-and-cheek pads** provide *full closure* around eye cavity.

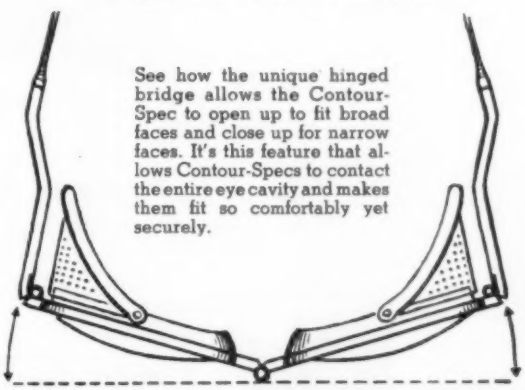
4. **Contour-shaped** adjustable plastic-and-cable temples hold spectacles firmly in place.

5. **Matching sideshields** are perforated plastic, providing protection at sides—*fold back* for pocket compactness.

Order a supply of Contour-Specs from your Willson distributor. Let your workers try their amazingly greater comfort, and see how they're preferred over ordinary safety spectacles!

6. **Butyrate frame**—*toughest plastic used for spectacles.* Standard frame is flesh colored, fitted with 6-curve Willson Super-Tough® glass lenses. Available also with green frame and sideshields, fitted with Willsonite® Super-Tough green glass lenses.

Hinged to fit any face snugly!



See how the unique hinged bridge allows the Contour-Spec to open up to fit broad faces and close up for narrow faces. It's this feature that allows Contour-Specs to contact the entire eye cavity and makes them fit so comfortably yet securely.

*Trademark

More Than 300 Safety Products Carry This Famous Trademark

WILLSON®

Established 1870

WILLSON PRODUCTS, INC., 207 WASHINGTON ST., READING, PA.

(For full details, use Key # Q-7 on free Inquiry Card on page 8.)

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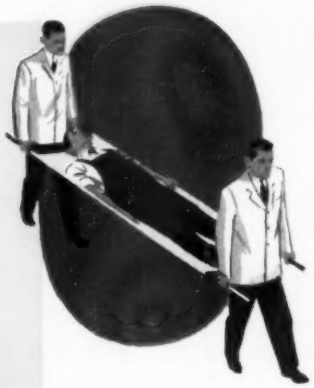
a little thing like a salt tablet* can be a big safety factor



Heat fatigue, especially during summer, is one of your plant's biggest problems. Unless the body salt lost through sweating is replaced, your workers not only become tired and less productive, but also may suffer serious heat prostration. As a result, costly accidents can occur.

***Morton Yellow Impregnated Salt Tablets** maintain the worker's body efficiency. Their controlled action gives *immediate* relief *without causing nausea,* as each salt crystal is thoroughly impregnated by a special patented process that controls the tablet's rate of dissolving. In this way, salt is replaced *immediately,* but at a *gradual* rate.

Assure your plant a high level of safety during *hot* summer months by ordering your supply now! Morton Patented Impregnated Salt Tablets are now included in a new Disposable Dispenser. A plastic and a heavy-duty aluminum dispenser are also available, as are *plain* salt tablets.

If your local safety equipment distributor cannot supply you, write:

MORTON SALT COMPANY
Dept. S-A 24, 120 So. La Salle St.
Chicago 3, Illinois

(For full details, use Key # Q-8 on free Inquiry Card on page 83)

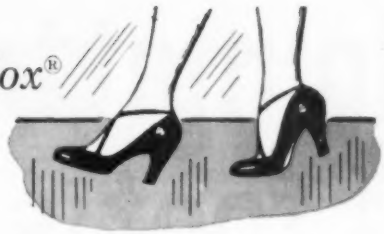
HEAVY DUTY
All White Rubber Knee Boot

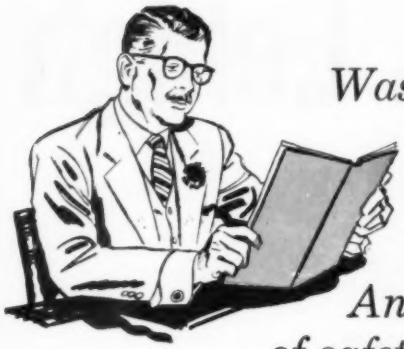
Available in
Plain Toe .....pair $5.50
Steel Toe .....pair $6.50
Sizes 6 to 13
Shipped Prepaid 15 pair or more
100% Satisfaction or Money Refunded

Scientific Industrial Supply Co.
17 E. 23rd STREET—CHICAGO, ILL.
Phone DA 6-4355

(For full details, use Key # Q-9 on free Inquiry Card on page 83)

The day Du Pont Ludox® added "anti-slip" to waxes





Was the day alert executives found the answer to safer floors

And now there's a layer of safety underfoot!

Every step is safer when you use floor waxes made with "Ludox" colloidal silica. "Ludox" gives a unique snubbing action which heads off slips before they start. Yet waxes made with it may be even harder and have added depth of luster. Ask your maintenance man to specify floor waxes made with anti-slip "Ludox." Have him get in touch with your wax supplier today.

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department
Wilmington 98, Delaware

For Safety Underfoot, Specify Floor Waxes Made With

LUDOX®

COLLOIDAL SILICA

DU PONT

REG. U. S. PAT. OFF.

Better Things for Better Living . . . through Chemistry

Here's how LUDOX® works in floor wax

"Ludox" has tough, transparent particles of minute size. The pressure of a footstep forces the hard "Ludox" particles into the softer, larger wax particles. This action absorbs much of the foot's forward-moving energy . . . gives positive traction underfoot.

(For full details, use Key # Q-10 on free Inquiry Card on page 83)

No matter what kind of in foot safety... Lehigh

THIS ONE'S A DILLY—an all-felt, plastic-bottomed "Parka" boot developed to prevent frostbite common in mines and lumber camps. 7-layer toe construction includes aluminum foil liner that reflects body heat and acts as vapor-barrier. To be worn with rubbers, or 4-buckle arctic in deep snow.

WRITE FOR THIS TODAY ⟶

MUCKER—a brand new type of steel-toe safety work boot developed by Lehigh for engineers, oil field workmen and all others who get into muck and sludge. Levis or regular pants can be tucked inside or worn outside. Loose fitting top is cooler, easier than laced-up boots.

HIGH WIRE ARTIST—specially designed for linemen. Built up heel hooks the pole step—steel plate and extra leather wedge under the arch keep feet from going to sleep on narrow rungs. Note extra flap at instep to resist scraping against pole; ease pressure of climbing spikes.

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Your employees will find it easy to order the best safety shoe for any job—from this poster in your safety or stores depts. Shows all 57 different styles that Lehigh makes, with complete details. You can order one pair or hundreds, as you need them. Size 39" x 24"—no advertising.

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SAFETY SHOE COMPANY
ALLENTOWN, PA.

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SPORT SHOE? Try and tell this one from any ordinary crepe-soled oxford! But the sole is Neoprene crepe that resists oil, grease, heat and abrasion, and inside is steel toe that withstands impacts up to a ton. Your men will like this smart way to save on two-in-one shoes for dress and work.

BRILLIANT YELLOW TOE CAP identifies this shoe in atomic energy plants so it can't be worn outside dangerous radiation areas. A simple change to adapt one of Lehigh's most popular work shoes to a highly specialized industrial hazard. What's yours?

TOO WET FOR SHOES—TOO HOT FOR BOOTS? Creameries, dairies, packing plants needed an in-between safety shoe for wet-floor departments. So Lehigh came up with this light-weight, ankle-hugging boot that keeps feet dry and safe—helps to prevent bone-breaking skids and falls.

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It's Safe to Say

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★ THE PRESIDENT'S CONFERENCE

INVITATIONS have gone forward from the White House to leaders in the accident prevention crusade to attend the President's Conference on Occupational Safety, scheduled for early May in Washington.

It is particularly gratifying to note that in these crucial times the President himself sees the wisdom of calling together the heads of governmental departments and representatives of business, labor, insurance, education as well as others concerned with combatting the problem of accidents in industry.

In the United States, we have the technical know-how to cope with the nation's accident casualties. More important, we have the proper spirit of conservation which places true values on the lives and well-being of our citizens. Contrary to the thinking of those countries who ruthlessly consider the state supreme, our duly elected and appointed public officials recognize that the country's greatest asset is its body of healthy, happy citizens protected to the utmost against industrial injury.

Management and labor are in perfect accord that accidents create a financial burden shared by every segment of our society. There is equal agreement that the tragedy of accident is every bit as poignant as the tragedy of war-time casualties.

Therefore, the sessions devoted to developing ways and means of solving the industrial accident problem are particularly timely. President Eisenhower has an intimate knowledge of battlefield casualties and the fact that he is concerning himself with casualties on the home front augurs well for the success of the Conference.

Findings developed at the President's Conference will be made available to safety leaders for the benefit of all our people. They can and will do much to stem the tide of what has been called a national disgrace.

★ JOB ENGINEERING NEEDED

ELSEWHERE in this issue appears an enlightening article by R. F. Brimmer, engineer for a leading insurance company. The author makes the point that safety equipment alone, vital though its contribution has proved to be, should not be expected to produce the ideal solution to the accident problem. The job must be "engineered" to remove the basic hazard, wherever possible, or minimize the results of existing hazards.

Unless the job is properly engineered, a pair of goggles, gloves or safety shoes will not prevent every single accident in the plant. The human factor must be considered. If a man fails to utilize the protective equipment provided by management, serious accident may result. On the other hand, proper job engineering demonstrated in actual case histories by Mr. Brimmer, plus the added protection of personal safeguards will go a long way toward preventing the *possibility* of lost-time injury. H. A.

Air Casualties

It's bad air that does it. But you can step up production by putting a Coppus Blower on the job to keep the air moving — and keep the men cool.

The kind of air a man works in has a lot to do with how much work he can turn out.

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- ☐ around cracking stills.
- ☐ exhausting welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.
- ☐ drying of walls, sheets, etc., after treated with coating material.

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Through Safety—

Eye Safety Program 20
Code for Explosive Powered Tools 23
Safety Shoes 33
Truck Emergency Light 74
Street Safety 75
Lightweight Goggle 79
Plastic Rope 79
Electric Dryer 80
Pilot Valves 80
Fuse Puller 80
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For full information write W. M. Partridge, Jr., Saf-Test Dept., Knapp Brothers Shoe Mfg. Corp., 173 Spark Street, Brockton 61, Massachusetts

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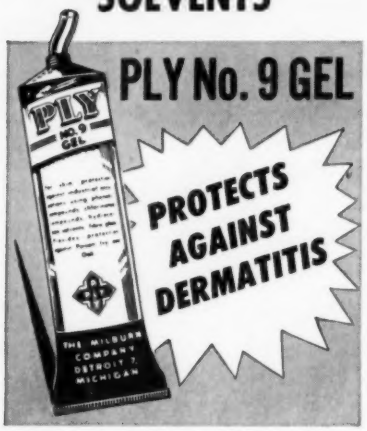
IF YOUR EXPOSURE IS HIGHLY IRRITATING SOLVENTS



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Ply No. 9 Gel contains the ingredient "Milbex" to prevent spotting or corroding of highly finished metals due to acid deposits from perspiration or any moisture caused by handling.

With Ply No. 9 Gel the worker no longer need fear the most commonly used acids, resins and solvents. Whatever the hazard, Milburn has developed a specific Ply Cream to combat it.

FREE! **WRITE FOR THIS VALUABLE BOOK!**

"The Answer to Industrial Dermatitis"

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Plyglovs can reduce your work glove costs as much as 75% — will outwear up to 10 ordinary pairs. Plastic coated to protect hands from industrial liquids.

THE MILBURN CO.
DETROIT 7, MICH.
PLY
The Standard of Perfection in Protection

(Use Key # Q-15 on Inquiry Card on page 83)

THE Future SHOWS

New York, N. Y. *April 5–9*

Twenty-fourth Greater New York Safety Convention and Exposition (Hotel Statler). George E. Decker, Lincoln Building, 60 East 42nd St., New York 17, N. Y.

Charleston, W. Va. *April 14–16*

Twentieth Annual West Virginia Safety Conference. Charles Hopkins, West Virginia Safety Council, 316–17 Masonic Office Bldg., Charleston, W. Va.

Columbus, Ohio *April 20–22*

Twenty-fourth Annual All-Ohio Safety Congress & Exhibit (Deshler-Hilton Hotel). James H. Fluker, Div. of Safety & Hygiene, Industrial Commission of Ohio, Columbus 15, Ohio.

Detroit, Mich. *April 20–22*

Michigan State Safety Conference (Sheraton Cadillac Hotel). Jerry Moore, executive secretary, Corporate Service, Inc., Detroit, Michigan.

Buffalo, N. Y. *April 20–22*

Fourteenth Annual Western New York Safety Conference and Exhibit (Hotel Statler); executive secretary, Eugene C. Hohlstein, Blaw-Knox Co., Buflovak Equipment Div., 1543 Fillmore Ave., Buffalo 11, N. Y.

Fort Wayne, Ind. *April 27–28*

Northeastern Indiana Safety Conference & Exposition. Ivan A. Martin, manager Fort Wayne Safety Council, Chamber of Commerce of Fort Wayne, Fort Wayne 2, Ind.

St. Louis, Mo. *April 27–29*

Central States Safety Conference and Exhibit (Hotel Chase). Reyburn Hoffman, The Safety Council of Greater St. Louis, 511 Locust Street, St. Louis 1, Mo.

Raleigh, North Carolina *May 4–6*

Twenty-fourth Annual North Carolina Statewide Industrial Safety Conference (Sir Walter Hotel). H. S. Baucom, Safety Director, North Carolina Industrial Commission, Raleigh, North Carolina.

Baltimore, Md. *May 6–7*

Annual Governor's Safety-Health Conference & Exhibit (Lord Baltimore Hotel). Joseph A. Haller, Safety Director, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

Chicago, Ill. *May 12–14*

Greater Chicago Safety Conference & Exposition (Sherman Hotel). Joseph F. Stech, Manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Washington, D. C. *May 17–21*

Fifty-eighth Annual Meeting National Fire Protection Association (Hotel Statler). National Fire Protection Assoc., 60 Batterymarch St., Boston 10, Mass.

Seattle, Wash. *May 20–21*

Twentieth Forest Products Safety Conference (New Washington Hotel). Pat Reiten, secretary, c/o Simpson Logging Co., Shelton, Wash.

Groton, Conn. *June 1–2*

Ninth Annual Connecticut Industrial Safety Conference (Griswold Hotel). John W. Kent, manager, Connecticut Safety Society, 26 Chaucer Court, Woodmont, Connecticut.

York Harbor, Maine *Sept. 16–17*

Twenty-seventh Annual Maine State Safety Conference. (Marshall House). A. F. Minchin, Secretary, Industrial Safety Division, Dept. of Labor and Industry, Augusta, Me.

Richmond Radiator Company
Monaca, Pennsylvania

Found a single answer to a DOUBLE PROBLEM in the M·S·A DUSTFOE #55

Rightly recognizing that voluntary respirator use on jobs requiring breathing protection depended on the selection of a respirator that would (1) answer workers' comfort needs and (2) keep maintenance to a minimum, Richmond Radiator safety planners made a thorough investigation of available models.

Their choice was the M.S.A. Dustfoe #55. Since then, the Dustfoe has become the standard for the plant.

Workers' comments on the Dustfoe have been most favorable. In the chemical mixing and blending operations, for example, the men like the small, streamlined design of the filter holder. "It lets you see what you're doing when you have to look down," is a typical comment. Several of the men have pointed out, too, that the minimum breathing resistance and light weight (2¼ oz.) helps eliminate job fatigue.

Simplified design and construction have played a big part in reducing maintenance. Filters are quickly replaced on-the-job, keeping the respirator at top efficiency. And because all parts are independently replaceable, any element, worn out after extended use, can be replaced in seconds.

The M·S·A DUSTFOE #55 —the Respirator workers will wear!

Designed for worker acceptance, the Dustfoe #55's streamlined appearance contributes to its greater eye-appeal, keeps distracting corners out of the line of vision, aids work concentration, and eliminates that "closed-in feeling" that hinders comfort and efficiency. Get the facts on this U.S. Bureau of Mines Approved respirator. Write for bulletin.

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SAFETY EQUIPMENT HEADQUARTERS

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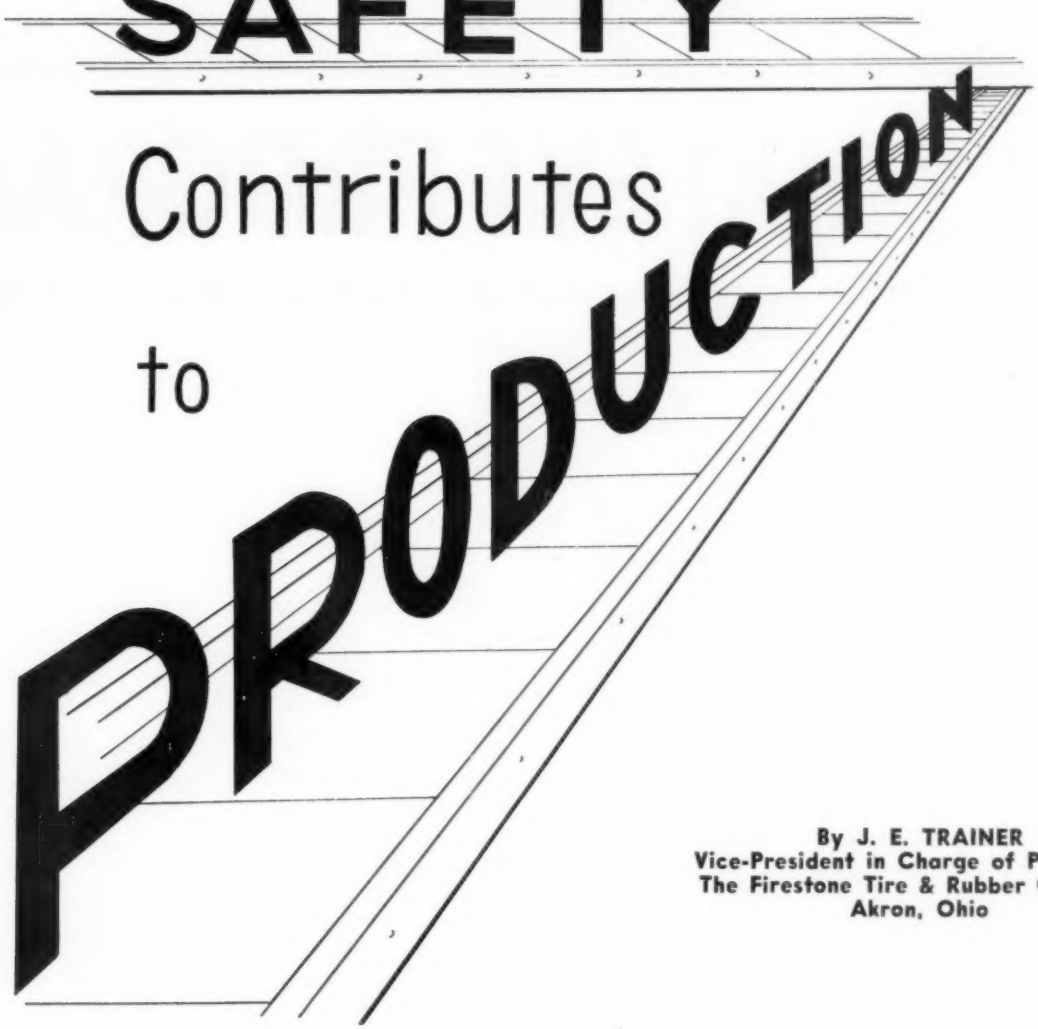
SAFETY MAINTENANCE & PRODUCTION

VOL. 107, No. 4 • APRIL, 1954

What SAFETY Contributes to PRODUCTION



By J. E. TRAINER
Vice-President in Charge of Production
The Firestone Tire & Rubber Company
Akron, Ohio

THE most compelling reason for a safety program is the welfare of the people who work in plants and their families. If a plant can't afford safety, it can't afford to be in business. It is essential to recognize industry's obligation to prevent accidents and their resulting pain and hardship. However, an effective safety program contributes to industry also in increased production and lowered production costs.

In a great many accidents there is damage to equipment as well as injury to an employee. In other accidents there is damage to equipment or buildings even though no personal injury is involved. Such accidents, resulting in property damage, entail losses of millions of dollars each year. Even though these property losses form a part of the total cost of accidents, let's leave them out of consideration of safety's contributions to reducing production costs.

Safety's contribution to production efficiency can be divided into 3 main categories. In the first category can be placed lowered direct costs of accidents such as compensation and medical payments. In our company's plants in the United States direct costs of accidents have been reduced to a point where they are more than 600,000 dollars below manual-rate figures. This saving in direct costs of accidents has resulted from reducing the accident frequency rate from 11.1 in 1945 to 1.5 in 1953 and the accident severity rate from 1.12 to 0.25. *(Cont'd on page 34)*

CAN YOUR EYE PROGRAM

FEATURE

Second article of a feature series on Eye Protection. The next article will appear in the May issue of SM&P.

By R. F. BRIMMER *

EYE protection programs of any kind are generally accepted as an important safety measure. Industry is urged to institute them . . . and as quickly as possible. Many varieties are offered . . . many types of equipment suggested . . . many things are overlooked. All too often the result is a hasty, improvised program without the basic research and careful planning to fit the individual situation that is necessary for a successful program. Accidents continue and even increase. Management may decide it's getting nothing for its money and give up the entire program. Even if the program is re-examined and the failures corrected, the false start has already cost eyes, money and time. Here is a group of eye program case histories . . . rickety structures that failed under the first pressure of accident. Much can be learned from the errors analyzed here and much avoided!

Case History #1

In a large plant, manufacturing a machine from start to finish, the foundry department cast aluminum into crank cases. Working conditions for the job were average, being hot, dirty, involving heavy work, and lacking top quality lighting and ventilation. Eye injuries were occurring with some frequency throughout the plant, and a study to reduce them was made which included the foundry. Ultimately, working from the job analysis and after consultation with outside agencies, a supplier of safety goggles was called in to recommend the proper type for each operation.

Engineering and design of process operation evidently did not receive much consideration, inasmuch as the final solution was to provide goggles and do very little else.

After the program had been in operation for a while, a drop in eye injuries was noted in the plant, except in the foundry. Investigation showed that the men did not want to wear goggles because they were uncomfortable, didn't fit well, fogged-up, and became dirty easily. The type of goggle that had been selected for the job operation was rechecked and again okayed for the various foundry jobs. The foreman of the foundry was accused of not enforcing the rule, and nothing else of a definite nature was done.

Accident Strikes

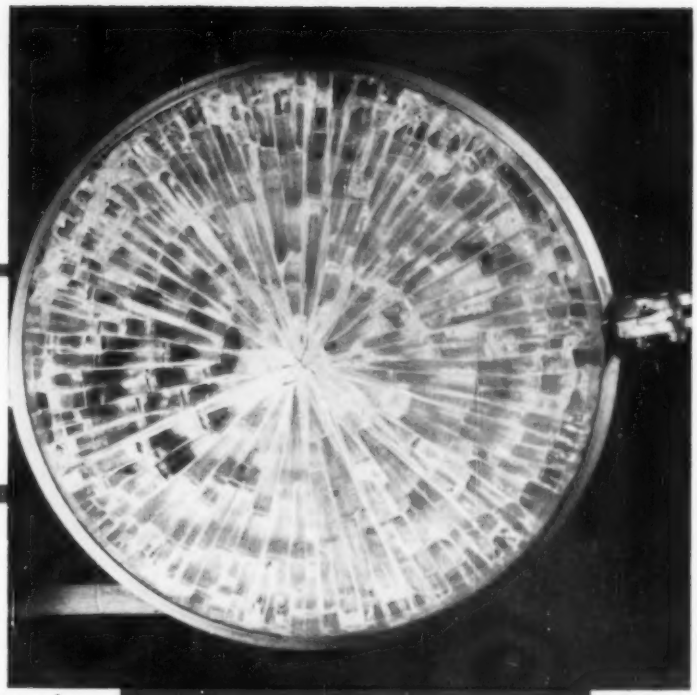
One day a pourer, while maneuvering the crucible over a mold was struck in the eye by a sudden metal splash.

Engineering of the job might have suggested a resin coating for the inside of the mold to prevent moisture, provision for more or better air vents in the mold, or better mechanical handling of the ladle.

Eventually the man lost 90 percent of the vision in one eye and the resulting costs were so high that the accident was thoroughly investigated. The goggle pre-

* The author is an engineer for a leading insurance company.

TAKE IT?



scribed for foundry use was found to be too narrow for the 75 percent of the workers who were Negroes.

Lack of proper or complete job analysis is evident.

Case History #2

A battery of welders down one side of a room in a large plant making motors and motor mounts was engaged in welding pieces to the motor mounts. After this operation, the mount went to several chippers to remove rough spots and finally, to a sand blast operation, where the weld was cleaned prior to heat treating.

The regular sand blaster was absent for several days and the foreman of the department requested a replacement. He was supplied with a sand blaster from another department. As the man was experienced in the job and in the plant, the foreman just showed him the booth and what the job consisted of, that is, getting the motor mounts from the chipper to the sand blast booth and then outside for further disposal. The man was equipped with a complete sandblast helmet, but the foreman did not mention to him the rule of the shop that all welding department workers and others who had occasion to pass through there, must wear eye protection at all times. *Here is an example of failure to instruct.*

The man did not wear safety goggles and as he stepped out of the booth and raised his helmet, suddenly he was struck in the eye by a chip from the chipping hammer of a man working 8 feet away.

This shows lack of planning, lack of engineering and design to provide shields or otherwise segregate the welding and chipping operations from the rest of the process.

The man completely lost his eye and his income potential was seriously reduced because of the physical

limitation. The cost to his employer amounted to 6,900 dollars for compensation and medical expenses alone.

Case History #3

This is the case of a man who no longer works, not because of the injury sustained on his job, but because of a poor attitude and a "wishy-washy" approach to a problem, both on his part and on the part of his boss.

A small machine shop, employing 15 to 20 men, was operating under the supervision of one foreman. The owner of the shop took very little interest in the actual production operations. There was no organized program of eye protection or any other safety measure. Lack of guards on cutting tools of milling machines, shapers, and other metal working machinery, together with a haphazard and crowded arrangement of the machines, resulted in a severe hazard to all employees from flying metal chips. This potential eye hazard was noted by the insurance engineer and reported to the manager.

Lack of engineering to provide these guards and establish a proper layout of machines to reduce the number of people exposed is illustrated in this case.

Since nothing was done, an analysis of accidents occurring within the shop showed a high frequency of eye cases as a result of the exposure noted on the inspection, but there was little or no serious injury. As it turned out, the problem became one of twofold proportions. The first one was to persuade the manager to furnish eye protection to his employees, and this was finally accomplished by a good presentation of a prepared accident analysis.

The second problem was how to enforce wearing of the goggles provided, because eye injuries continued to occur, proving the protection was not being used. In discussing the situation with the owner, the engineer was met with the statement: "The men just won't wear them. In fact, one of your own men was through here the other day and he could not make the men wear goggles." The owner also stated that he was far too busy on other matters to spend much time in the shop and enforce the rules which he himself had made. Replying to the next logical question, as to what was the matter with the foreman, the manager said that he was an old-timer, with 20 years in the shop and a rugged attitude toward all such devices. He not only refused to set an example by wearing safety goggles himself, but condoned the violation of the rule by the men who did not wear them. The owner insisted that his shop was so small and business conditions were such that he simply could not afford to fire anyone for failure to wear eye protection, especially his foreman.

Other means of discipline are possible, with firing only as a last resort. Friendly explanation, cautioning, reprimand, reduction in pay, disagreeable tasks for violators, all can be used. Discipline is the kind of leadership which makes penalty rarely necessary.

One day, the foreman, while standing about 2 feet from a shaper, bent over to see that the proper cut was being made by the tool, and suddenly was struck in the eye by a chip. He was away from the job for 5 weeks and finally returned, completely blind in one eye, wearing a patch over it.

Several things immediately became apparent. The foreman was self-conscious about his mishap and was considerably on the defensive about it. As a result, many of his decisions were hurried and not as unbiased as they had been previously. The same trait of indifference or intolerance, already displayed in regard to wearing personal protective equipment, became apparent in other aspects of the job. These traits were more noticeable to the owner of the business because, in the foreman's absence, he had been forced into closer contact with the shop and its operating personnel. Finally, things came to such a point that the foreman was fired, a step previously said to be impossible, and at that time not at all necessary had other and firmer steps been taken.

It might be a good idea to admit in this case that accidents cannot be engineered and designed out of equipment. Also, that in the broad sense, the wearing of personal protective equipment can be considered as engineering, and on some jobs 100 percent protection is desirable.

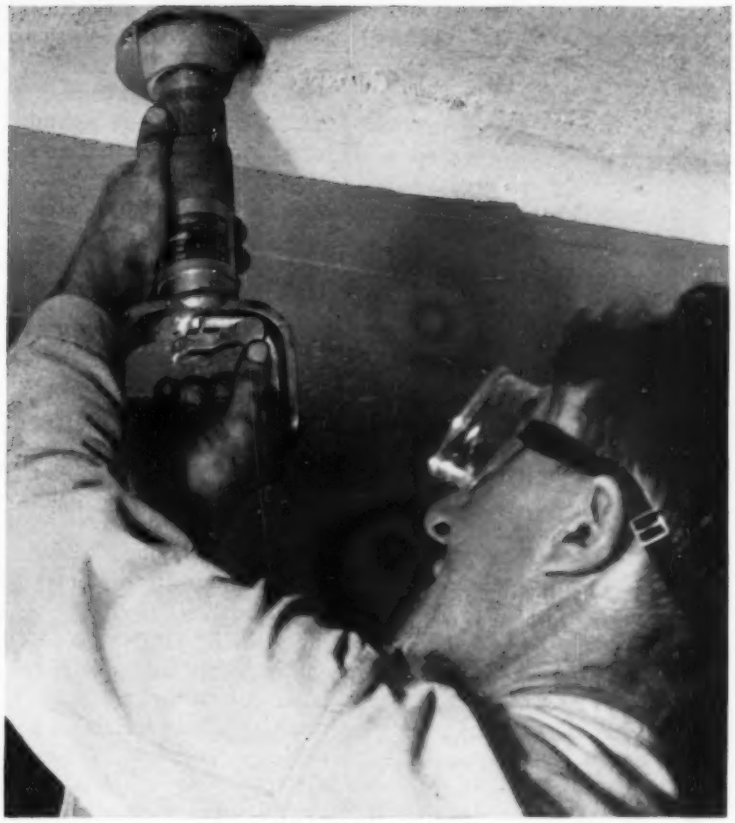
Case History #4

A man was employed in a chemical plant whose production operations were largely concerned with receiving, repackaging and shipping industrial chemicals, mostly concentrated acids and caustics. Most of the transfer was done by hand and none of it by piping or other enclosed operations. The injured man was pouring a caustic from one receptacle to another, when suddenly a flash from the mixing precipitated the material into his eyes. After 4 months of treatment, he was declared industrially blind in one eye, with considerable impairment of vision in the other.

Here is a case where engineering and design could have almost completely enclosed the operation and provided an absolute minimum handling of materials by hand.

The preceding history of this plant leading up to the accident explains how it happened. In the process of expansion a large, nationwide chemical organization bought the independent company. The entire staff was retained, and, as the product was sorely needed in other operations of the large organization, no production changes were made immediately. The national safety director of the corporation visited the plant to see what could be done about the high frequency of eye injuries. On his first visit, he noted, among other things, a lack of any eye protection at all, no emergency eye bath fountains, and a minimum of first aid equipment. His review and analysis of accidents confirmed that injuries were resulting from the very evident exposures noted on his trip through the plant.

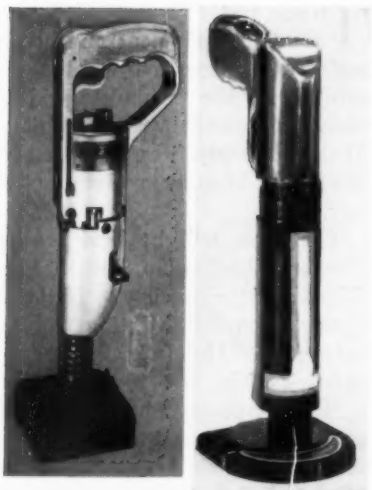
(Continued on page 27)

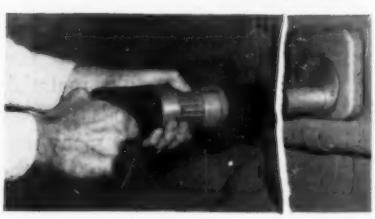


All the powder activated tools illustrated here are models that have been approved by the New York State Board of Standards and Appeals

New York State sets up a new

Safety Code for EXPLOSIVE POWERED TOOLS





USE of explosive-powered tools, which employ blank cartridges to drive metal pins or studs into concrete, is now regulated in New York state by the State Labor Department under the terms of a new Industrial Code Rule that was prepared and approved by the Board of Standards and Appeals and that became effective March 1.

Since World War II many industries, particularly building construction, have used powder activated tools for such purposes as cutting various sizes and types of cables, splicing or attaching terminal fittings to cables, removing and tightening rivets, joining pipe, and driving solid or hollow threaded steel studs. Hazards of the devices include accidental discharge, ricochet, explosive atmospheres, and going completely through the work surface and hitting somebody on the other side.

In announcing the New York code, Industrial Commissioner Edward Corsi said, "The explosive powered tool is a comparatively new production innovation. Our code is an attempt to protect the worker from injury while using the relatively high-hazard machine. At the same time it will enable the employer to reap the benefit of technological improvement."

The most significant actions of the new code require registration and approval of all tools by the N. Y. State Labor Department's Board of Standards and Appeals, minimum qualifications for operators, and adequate maintenance and storage standards for the tools. The code also prescribes correct operating methods while using them, and prohibits their use in driving studs into hardened steel.

The code requires that every explosive powered tool used in New York state after March 1, 1954 carry

both an approval number and a serial number for its individual identification. Such tools must have the following characteristics:

1. The muzzle end of the tool shall have a securely attached protective shield not less than 3 inches in minimum dimension perpendicular to the barrel, designed to confine free flying particles and arrest the ricochet of the projectiles; or, in lieu of such shield, a jig or fixture providing protection equivalent to that afforded by such a shield.

2. The firing mechanism shall be so designed that the tool will not fire unless the protective shield, jig or fixture is present in its proper position on the muzzle end.

3. The firing mechanism shall be so designed that the tool will not fire due to being dropped from any height.

4. Firing of the tool shall be dependent on at least two separate and distinct motions with the muzzle end in firm contact with the surface of the work.

5. Protective shields may be retractable for working in recesses or boxes but shall be so designed that when the barrel is removed from a recess the shield shall automatically return to its normal operating position.

6. Extension barrels must be equipped with protective shields, jigs or fixtures.

7. All safety features shall be durable and shall be so designed that they cannot readily be rendered inoperative and so that they reset after each firing.

8. Every tool shall be so designed that it will not operate if the axis of the barrel is inclined more than 15 degrees from a position perpendicular to a smooth test surface.

9. All breeching parts must be sufficiently visible to disclose the presence of any foreign matter that may be present.

Other Rules

Other significant regulations call for: use of the tools only by qualified personnel; storage in a locked room or compartment; prohibited use of the tools to force a projectile into or against hardened steel, high tensile steel, cast iron, hard brick, glazed brick or tile, terra cotta, marble, granite, slate, glass, or any other extraordinarily hard or brittle material; wearing of safety goggles or safety glasses by the operator, to be provided by the employer.

Under the heading of OPERATORS, the code discusses required qualifications, persons not qualified, duty of employers and persons in charge, and training exemption.

The section on MAINTENANCE & STORAGE OF TOOLS covers: storage room, care and storage of explosives, containers for tools, use of container, safeguarding of tools, meddling, leaving unattended, and instruction manual.

The final section of the code is on the OPERATION OF TOOLS and includes: use for intended purpose, use with hard and brittle material, direct penetration, angle of discharge, selection of load, edge shots, pointing or holding, bystanders, no complete penetration, operator to know conditions, flying projectiles, muzzle, clogging, misfires, use in hazardous places, eye protection, loading, pre-drilled holes, inspection before use, defect during use, and manufacturer's recommendations.

Although explosive powered tools have already proved their worth as efficient production equipment, there have been numerous cases of accidental death and injury resulting from carelessness and misuse of the devices. The New York state code is designed to make such tools weapons of production instead of destruction. Other states that have safety codes for the use of powder activated tools are: California, Idaho, Massachusetts, Ohio, Oregon, Washington, and W. Virginia.

Copies of the New York state regulations, "Industrial Code Rule No. 40," may be obtained for 25 cents per copy from the New York State Department of Labor, Room 601, 80 Centre St., New York 13, N. Y.

Pictures by courtesy of (Top to bottom and left to right): Velocity Power Tool Company; Remington Arms Company, Inc.; Ramset Fasteners, Inc.; Powder Power Tool Corp.

President Will Open May 4 Safety Meeting

PRESIDENT EISENHOWER will open the President's Conference on Occupational Safety scheduled for May 4, 5 and 6, 1954, in Washington, according to Secretary of Labor, James P. Mitchell.

Bringing together some 1,200 of the nation's top leaders of business, labor, insurance companies, educators, state and federal officials and private safety organizations, the conference will consider further means of reducing the annual toll of some 1,450,000 disabling injuries including 8,800 deaths in construction, manufacturing, public utilties, trade, finance, service and government, the areas primarily serviced by the organization.

The day before the main conference, some 500 safety technicians from all over the country will meet in conference committees. These committees include Accident Records, Analysis and Use, Engineering, Education, Research, Governmental Safety Services to Industry, Public Employee Safety, and Community Occupational Safety Programs.

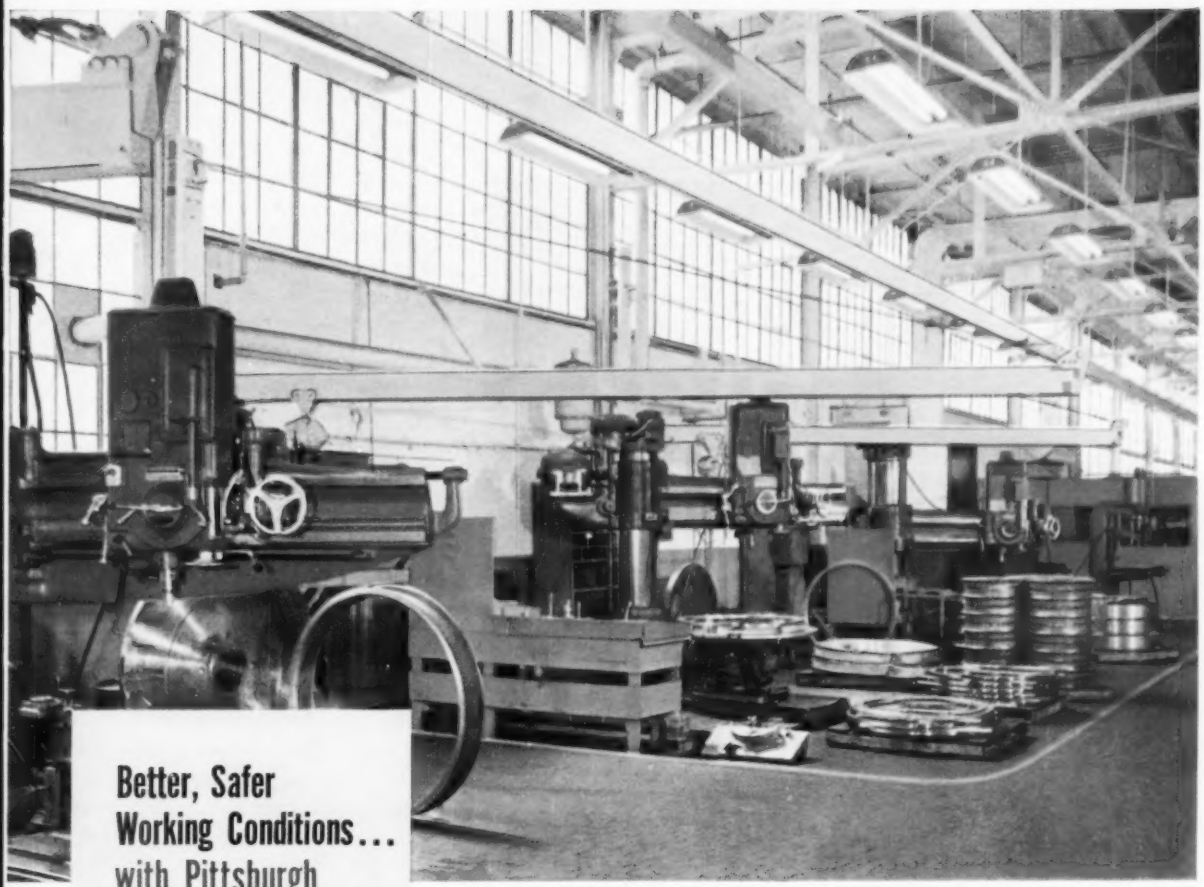
Welding Show

THE most elaborate display of welding equipment and accessories ever assembled will be on exhibit at the second Welding Show, sponsored by the American Welding Society, it was disclosed by Joseph G. Magrath, national secretary.

The show will be held at the Memorial Auditorium, Buffalo, May 5-7, and the society's National Spring Technical Meeting will be held at the Hotel Statler, in the same city, May 4-7.

"Every type of industry will find something new and useful among the exhibits," Mr. Magrath declared. "Our technical meeting will present dozens of papers for engineers anxious to keep abreast of new methods of welding old materials and of how old methods may be adapted for use with the many new materials now coming out of the research laboratories."

(For a copy of booklet described on opposite page, use Key # Q-18 on Inquiry Card on page 83)



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Eye Program

(Continued from page 22)

The safety director informed the plant manager of his findings and suggested a complete eye conservation program with the immediate use of the proper type safety goggles for the production men. Like most managers faced with a new situation, he was much too busy with problems of executive change-over and production and said he would attend to it when he had time. His final remark was, "Write me a letter about it."

At this point, the problem should have ceased to be one for the safety director and should have been referred to the parent organization for action. Perhaps the original independent owner did not have money enough to re-design his plant equipment extensively, but the larger organization did and should have taken steps.

After writing the requested letter and waiting several weeks, with no apparent action being taken, the safety director, on his own, shipped a supply of goggles to the plant and again visited the manager, with the suggestion that he call the men together, explain the exposure, and the need for protective equipment, and then issue the goggles at once, either directly to the men or through his supervisory staff. Again, the manager insisted that he was too busy and felt that it was not his duty anyhow inasmuch as safety matters should be handled by the safety director. If any meetings were to be called, he said that he would make the arrangements, but the safety director would have to do the talking. Reluctantly, the safety man agreed.

There he was, trying to settle for a slice, when he knew he couldn't get the whole loaf, a perfect stranger to the men, and probably resented as a home-office big-shot, and trying to do somebody else's job. As a result of his efforts, it is easy to imagine what happened. Those goggles that were worn, were worn either on the forehead or on the bench, and in a few days came the accident described.

This is an example of an accident due to lack of proper presentation of a problem, and top management failing to sponsor, direct or otherwise participate actively in safety

Case History #5

This accident resulted in no injury, or very little injury; but it did turn up a very interesting flaw in the company eye protection program.

A doctor's report came to the desk of the safety engineer of a shipyard. In brief summary, it stated that a man had reported to the doctor and had a very fine sliver of glass removed from his eye. The sliver had not been imbedded. When the doctor asked to see the goggles that the man had been wearing, he found one of the lenses shattered to such an extent that they fell out in his hand, as the man passed the goggles to him. It seems that the man, a welder, had raised his hood to examine a weld and as he did so, a piece of slag cracked from the weld, flew against the bulkhead, ricocheted to a second bulkhead, and then struck with terrific force in the center of the man's goggles. Other doctors on duty at the time were consulted and they unanimously agreed that, had not this man been wearing goggles under his hood, the impact would have been so terrific that it would have driven the slag entirely through his head!

There was a good safety program in effect at the yard, which included a complete eye protection program. However, the fact remained that impact cases in or near the eyes were occurring much too frequently. The safety engineer knew that rules were in effect, and to the best of his knowledge, they were enforced. He ascertained that there was a fairly high turnover of welders, before checking this. Accident investigation reports, prepared by the foremen, in many cases gave the cause as "carelessness" or "disregard of instructions."

The safety engineer's first step, with this information in hand, was to check up on the foremen as unobtrusively as possible to determine what enforcement measures were being taken. He found that welders were working without goggles under their hoods, but that the foremen took steps to correct the hazard whenever they observed it. However, with 25 men more or less screened from view and with other duties to perform, the foremen obviously could not be everywhere at once. The safety engineer then ascertained that a copy of the departmental safety rules on welding was given each new employee. Moreover, the records showed that in 75 percent of the cases of injury in or near the eye, men with more than one month's service were involved. With this as a clue, he went to talk to the foremen.

He frankly presented all these facts and asked if they couldn't go into the situation to see what corrective measures could be taken. The foremen at first made the usual defensive statements, including the old familiar one, "If I've told them once, I've told them a dozen times," but finally, being sensible fellows, stopped generalizing and got down to cases. They knew that they emphasized the rules to each new employee, knew that they reemphasized them when they noticed a violation, but in checking back over, realized that on a routine basis, probably they had never repeated the instructions to the same man more than once or twice.

Many times it is the simple things that need repeating and that will produce results. Good instruction and proper explanation are two items in this category.

Case History #6

A large plant employing 5,000 men was engaged in a metal working and metal fabrication operation. A particular shipment of parts was received from one of their suppliers at a time when they had no facilities for proper storage. As a result, considerable damage resulted from corrosion, dirt, and introduction of foreign material, which made necessary a certain amount of light chip-

ping, wire brushing, and buffing before the parts could be processed. This was set up as a temporary job, which in all probability, would not be necessary again.

How many temporary jobs are improperly safeguarded for the reason that they are temporary!

Two middle-aged men, one from Stock and the other from Inspection, were moved into a bay off one of the main departments formerly used for storage, given the necessary equipment and put to work.

Middle-aged men with a very probable eye or vision deficiency, changed from one job to another, a very different one, with the strong probability that the change was resented . . . a bad safety error.

Inasmuch as there was no natural light in the bay, temporary lights were installed; safety goggles were drawn from supply and furnished the men, and the tools were hooked up. Then the men were left pretty much to themselves since they were part of a production department.

Lighting was not checked and was evidently inadequate. A goggle was furnished to men with possible vision deficiency, which was strange to them if they had not worn goggles previously, or different from the eye protection they were used to.

One day the safety engineer was visiting the nurse in the dispensary to get information on a medical case, the only type of injury thoroughly investigated in this plant, and eventually the talk led to eye injuries. The nurse remarked that it was about time that either Brown, Snyder or Palmer came in to have something removed from his eye. It seems that these 3 had been reporting on an average of a couple of days per week for such treatment, but that nothing serious had yet developed. This was the first that the safety engineer knew of the job, and upon looking into it, he learned that Brown and Snyder were the two mentioned at the beginning of this case history and that Palmer was the truck driver supplying them. A check of the records showed that the last eye examination of these 3 men had okayed them for the work being performed at that time.

A study of all available facts, including first aid cases, is always desirable. A satisfactory eye examination report for one job does not necessarily mean that vision would be approved for another job.

As coincidence would have it, at that moment in came Snyder, one of the men doing the cleaning job, with a wire bristle from the brush driven deep into his eye. Subsequently he lost 30 percent of the vision of that eye and his inspection job along with it. Investigation showed that none of the operations on this particular little job had been shielded or otherwise segregated. Furthermore, the men had used the goggles but sparingly for the simple reason that they couldn't "see good with them." The other, Palmer, had no safety goggles issued to him because it so happened this was the only stop on his route which would have been considered an eye hazard area.

Enclosure or segregation of the operations was neglected only because it was a temporary job. There was no provision made for correction of vision due to a change in job, nor was any consideration given to the protection of truck drivers, inspectors, or other visitors who might have occasion to enter the area.

Case History #7

A safety engineer and a department superintendent stood in the doorway of the superintendent's office looking out over the assembly floor of an airplane manufacturing plant. In common with most such operations, nearly every employee was using or had access to a portable electric drill. Also, the floor was liberally sprinkled with grinding wheels on which the employees were accustomed to dress the bits. Naturally, there was considerable exposure to all of the employees from these grinding operations.

All at once there was a commotion at one end of the floor and 2 men rushed the foreman out to the hospital with blood streaming down his face. Upon questioning one of the men, the superintendent learned that, "Bill was just standing there when all of a sudden he was struck in the eye by a bit which knocked off while it was being dressed." Bill completely lost that eye; the plant lost a good man, a considerable amount of production due to replacement, re-shuffling and substitution of manpower within that department, as well as 10,000 dollars worth of compensation and medical payments.

The conversation which had been taking place in the doorway of the superintendent's office was the third such one. The safety engineer was calling attention to the fact that nearly all the employees were exposed to a potential eye hazard through the general dissemination of grinding wheels throughout the floor and the inadequacy of the eye protection afforded.

Here is a condition that could be readily corrected through design and engineering, as was subsequently done in this plant. All grinding wheels were removed from the floor and a separate, completely enclosed, tool dressing room set up in charge of one man who could be adequately protected by shields and proper goggles.

From an address presented at the 21-t Greater New York Safety Convention.

Inter-American Council Expands Safety Program

EXPANSION to increase services to members was the keynote of the 59th Quarterly Inter-American Safety Council Board of Directors meeting, held in New York recently. Mr. R. J. Farlow, Council Vice President presided.

Detailed plans to increase services to present members of the Council, to broaden Council activities to include home, traffic, farm and school safety and to expand and improve field representation were reviewed and approved by the board. Plans for a membership drive in keeping with the increased activity in South and Central America were developed.

What Difference Does Wax Make On VINYL PLASTIC FLOORS?

By CYRIL S. KIMBALL, DAN SHOENHOLZ and GEORGE D. BURNS
Foster D. Snell, Inc.
New York, N. Y.

FEATURE
First of a series of feature articles on Flooring Maintenance. Next articles will appear in the May and June issues.

THIS report describes a series of floor service evaluation tests to determine the effect of the use of floor wax on vinyl flooring. Our carlier laboratory evaluation studies disclosed 6 findings:

1. The appearance of the tile, as judged by gloss measurement, is greatly improved by waxing.

2. The use of wax does not significantly change the coefficient of friction or slip properties of tile.

3. The soiling tendency of vinyl tile may be substantially decreased by waxing.

4. Soil removal by scrubbing is greatly facilitated where vinyl tile has been previously waxed.

5. Pronounced protection against marring of the surface results from waxing.

6. Some difficulty may be encountered in waxing brand new tile flooring with emulsion type waxes because of poor wetting and spreading. However, our experience with vinyl floor installations indicates that after a period of use this condition disappears.

Two types of test floors were used in our latest floor service evaluation tests. They were arbitrarily designated as subjected to moderate and severe traffic. The "moderate traffic" flooring was installed in one of the floors of the laboratory building. It is estimated that the equivalent of approximately 150 to 200 persons walked on the floor daily. In addition to foot traffic a supply cart was drawn over it two or three times a day.

The other test floor was in the vestibule of the laboratory building leading directly to the lobby from

the street. It is estimated that an average of 600 persons walked on this floor daily. At the end of every day of service, whether on wet or dry days, an accumulation of street dirt was clearly noticeable. This condition was judged to be severe traffic.

Test Floor Maintenance

In the case of the moderate traffic test floor the following schedule of maintenance was followed:

Each vinyl tile panel was divided into four equal square sections, consisting of 4 tiles each. One section was left unwaxed and each of the others was waxed with one coat of 3 typical floor waxes. To equalize traffic each panel was rotated 90 degrees and advance one position every other day. At weekly intervals the panels were swept and damp mopped. Every two weeks the panels were scrubbed free of wax with ammoniacal soap solution. The panel sections were then waxed, after gloss and reflectance readings had been taken before stripping the old wax and after stripping. The readings were also taken after waxing and during the period of traffic, before and after damp mopping. This schedule was continued for 16 weeks.

The test floor panels subjected to heavy traffic were waxed initially, gloss and reflectance read before and after waxing, and the panels rotated 180 degrees every other day to equalize traffic. The panels were swept and damp mopped every fifth day of exposure to traffic. Gloss and reflectance were determined before and after sweeping and damp mopping. The procedure then followed that applied to the floor with moderate traffic. However, to eliminate the effects of moisture, the panel was removed from the floor on rainy days. Each type of vinyl tile was tested in this fashion for 30 dry days of traffic. The same type of wax was applied to the same panel section in each of the tests.

The properties studied in the tests were concerned with whether or not the waxing improved the appearance of vinyl tile in terms of gloss and as measured in terms of reflectance. The desirability of good gloss was felt to be self-evident. The reflectance measurement characterizes the effect of waxing on cleanliness since a soiled floor generally exhibits lower brightness than a clean floor. The effect of waxing in improving the gloss of vinyl tile floor was studied at 3 points in the normal procedure of maintaining the floor:

1. The initial gloss improvement resulting from waxing each time the floor is rewaxed.
2. The degree of gloss improvement maintained during the period the floor is in use between waxings.
3. The effect of the wax in maintaining the inherent gloss of the vinyl tile.

In all, 8 sets of gloss readings were taken for each type of tile and for each wax. The unwaxed tile showed a loss in gloss ranging from 33 to 48 percent of the original gloss. The waxed tiles on the other hand showed a gloss improvement of 19 to 223 percent. These percentages were based on a comparison of the original cleaned tile at the start of the test with the average gloss improvement as a result of waxing. The average percent gloss improvement for waxed tiles as compared with the average gloss of the unwaxed throughout the test period was also calculated. These data show that when the gloss improvement on waxing of the tiles is compared with the gloss of clean but unwaxed tiles after being subjected to heavy traffic, the percent of gloss improvement figures range from 81 percent to a high of 460 percent. When it is noted that unwaxed tile shows considerable loss in gloss as a result of traffic and waxed tiles show improvement in gloss, either compared to the original state of the unwaxed tile or to the state of the unwaxed tile during traffic, the desirability of waxing to improve gloss is unmistakable.

Effects of Service

The next thing to be considered is whether or not the gloss advantage introduced initially as a result of waxing is maintained between waxings and during the time the test panels were subjected to traffic. The average gloss and the percentage gloss improvement for waxed vs. equally trafficked unwaxed tile through a period of 16 weeks for the test floor subjected to moderate traffic and through a period of 6 weeks for the test floor subjected to heavy traffic was calculated on the basis of observations taken each week after damp mopping for the moderately trafficked floor and each 5 days of traffic after damp mopping for the severely trafficked floor.

In every case, for each wax and for each tile a considerable percentage improvement in gloss was found. The lowest degree of improvement for the moderately trafficked floor being 36 percent, the highest degree of improvement was 200 percent. The lowest degree of improvement for the severely trafficked floor was 14 percent and the highest was 100 percent.

It is clear therefore, that not only is a valuable improvement in the gloss of vinyl tile gained immediately upon waxing, but that a higher gloss is maintained during the period that the tile is being walked on during traffic and before rewaxing. As might be expected the overall effect is not quite as marked where the vinyl tile was subjected to moderate traffic.

Preserving Tile Appearance

Another question to be answered is whether or not a waxed vinyl tile floor will retain the initial gloss of the tile itself better than an unwaxed vinyl tile floor. Measurements to determine this were taken on the vinyl tile panels after removal of the wax.

For each tile under each set of test conditions, the average of all gloss readings taken for the waxed tile after the wax has been stripped from the surface and for the unwaxed tile when given the same scrubbing with ammoniacal soap solution were calculated. These average gloss readings were then compared to the gloss of the orig-

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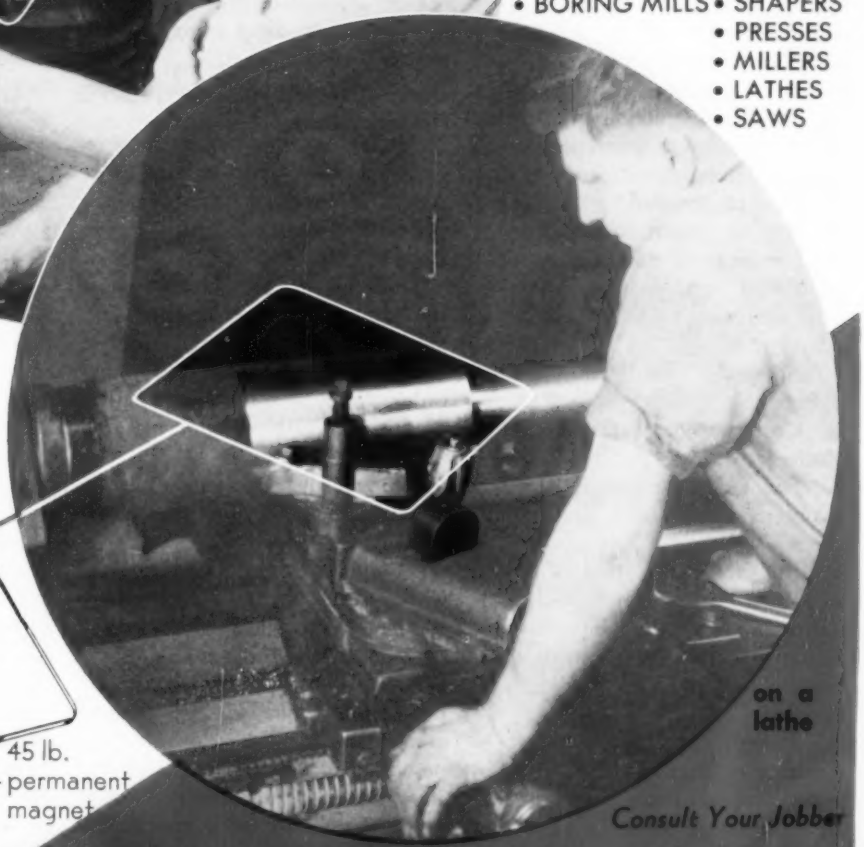

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inal tile after cleaning and before subjection to traffic. It was found that for most tiles a greater percentage of the original gloss is retained when the tile has been waxed than when it is unwaxed.

The gloss of the waxed tiles has also been compared with the gloss of the unwaxed tiles on the basis of equal traffic. It was found that for moderately trafficked floors the gloss retention for waxed tiles ranges from a low of 100 percent to a high of 157 percent of the gloss of the unwaxed tile. For the severely trafficked tiles, values range from 105 to 163 percent. Comparison of the values for the tiles subjected to severe traffic and moderate traffic suggests that under severe traffic conditions the protection of a wax coating to preserve the appearance of the tile surface itself is even more necessary.

It is the conclusion of these tests that the waxing of vinyl tile not only contributes to improvement of appearance over unwaxed tile, but also provides a protection in that the tile surface itself is preserved against the abrasive effects of traffic when preservation is measured in terms of gloss of the tile after stripping off the wax coating.

By way of illustration of the manner by which floor waxes exhibit a protective and preservative effect upon vinyl floor surfaces, photographs of the floors tested show considerable numbers of scratches on the unwaxed surfaces not present in any similar degree in the waxed surfaces.

Effect of Wax on Maintenance

The utility of waxing as a means of aiding in the maintenance of the cleanliness of vinyl flooring was considered from two viewpoints in the test.

1. How does the degree of soiling for waxed and unwaxed flooring exposed to the same traffic conditions compare?

2. Does wax protect the floor against soil embedment, thereby preventing the gradual development of a dingy appearance due to difficulty in removing soil?

Reflectance values were measured on the tiles after each week of traffic just before damp mopping and after sweeping. The values are therefore a measure of the effect of soil in reducing brightness of the tile. From the average values the percentage brightness retained by each type of tile and comparison with the reflectance or brightness of the original tile before subjection to traffic has been calculated. For tiles subjected to moderate traffic it was found that the unwaxed tiles showed a percent of brightness retained of 63 to 86 percent. For the waxed tiles it was found that the percent of brightness retained ranged from a low of 71 percent to a high of 97 percent of the reflectance or brightness of the

Yale Lists Nine Points to Safety

ANALYSIS of 778 accidental injuries to Yale University employees indicates that *all* could have been prevented. "The Yale Challenge," prepared by the Department of Accident Prevention of Yale University, reports that their experience covers a period of two and one half years ending January 1st, 1954 and thus provides a reasonable basis for prompt action to reach the following objectives:

1. Employees physically and mentally qualified for their work.
2. Specific instruction and supervision to make safe procedures habits of action.
3. Prompt removal, guarding, or marking of hazards.
4. Provision of effective personal protection equipment, and definite measures to make sure it is always used.
5. Adequate guards for specific danger points always used.
6. Correct tools and equipment always used.
7. Periodic inspection and regular maintenance of tools and equipment.
8. Immediate reporting of injury to Department of University Health (after hours to the University Infirmary) so that proper medical attention may be given and recovery speeded.
9. Prompt report of accident to Director of Accident Prevention in order that assistance may be given in determining particular cause and measures suggested to preclude recurrence.

According to Lincoln H. Lippincott, director of the university's accident prevention program, typical accidents in different Yale departments included the following:

Stood on table to erect bookcase —table tipped—fell—ankle twisted.

Removing broken glass—part of equipment—splinter of glass in eye —no safety glasses worn.

Plastic chip rebounded from saw —struck left eye.

Beer can left on top step caused slip—fell one flight—shoulder injury.

Cleaning machine while it was running—finger caught.

On job one month—involves repeated lifting—wrist sprained.

Scissors used to open carton—standard opener provided—finger lacerated.

These accidents resulted because the injured did not do their jobs properly. Avoidance of accident is an essential part of correct procedure. They were hurt because they did not *KNOW* or knowing, did not *DO*.

The remedy?

1. Examine procedure to locate hazards.
2. Emphasize these hazards to workers.
3. Check to make sure efficient (safe) action is being followed.

Each month a single accident prevention objective is amplified and illustrated by typical Yale cases described in "The Challenge," and the Director of Accident Prevention of the University offers specific aid in analyzing procedures to locate danger points and to devise methods or equipment to eliminate or minimize hazards.

original tile. For the tiles which were exposed to severe traffic the unwaxed tiles show a percent brightness retained ranging from 56 percent to 63 percent, while for the waxed tiles the percent brightness retained ranges from 65 percent to 82 percent. In all cases the waxed tiles showed significant superiority over the unwaxed tiles in brightness and therefore in cleanliness.

Restoration of Cleanliness

A uniform technique of scrubbing the floor panels was used. Scrubbing was done by hand, using an equal number of scrubs in each direction for each tile panel. For the liquid solvent wax the wax itself was used as the wax remover making use of the solvent action of this type of polish. From the average reflectance figures, already calculated, the percent brightness retained for the waxed and unwaxed tiles vs. the brightness of the brand new tile was established. For the unwaxed tile which received moderate traffic the percent brightness retained ranges from 78 to 89 percent of the brightness of the original tile. For the waxed tiles the percent of brightness retained ranges from 82 to 98 percent of the brightness of the original tile. For the unwaxed tile which was subject to severe traffic the percent brightness retained ranges from 72 to 79 percent of the brightness of the original tile while for the waxed tiles the percent brightness retained ranges from 76 to 95 percent of the brightness of the original tile.

To summarize, it was found, through carefully controlled floor service tests carried out over a reasonably long period on representative types of vinyl flooring using representative types of waxes and following normal maintenance procedures, that waxing will:

1. Provide a great improvement in the gloss of vinyl tile.
2. Aid in maintaining a good gloss.
3. Reduce soiling and soil embedment during use.

Should the owner of a vinyl tile floor accept the tenet that the waxing of vinyl tile floor is unnecessary, it is the conclusion of this report that the floor will deteriorate in appearance as the result of loss of gloss. In failing to wax the vinyl tile floor, the owner will fail to make use of an opportunity to improve the appearance of his floor when new and he will be neglecting a means of helping to protect and preserve the tile surface against scratching. Further, he will find that his floor acquires a soiled appearance more rapidly and will therefore need to be washed more often. Such a floor will progressively build up a content of embedded soil which is not removable by normal floor cleaning methods, so that the original bright appearance of his floor will progressively deteriorate.

The answer then to the original question posed for this study is "vinyl plastic flooring does require waxing."

Pictures by courtesy of Foster D. Snell, Inc.

From an address delivered to the Waxes & Floor Finishes Division, Chemical Specialties Manufacturers Association, Inc.

"SAFETY MAINTENANCE" Salutes a Safety Idea

THERE'S MONEY IN SAFETY SHOES

THE safety department of the Lone Star Steel Company has started handing out silver dollars to employees found wearing safety shoes. Not to everyone of course, at least, not all at once. But there's a chance for all the employees to win eventually. Here's the way it works:

One day each week a committee goes to the time-clock and selects 10 cards at random. Then it visits the men who punch those 10 cards. Any of the men who is wearing a pair of safety shoes gets a bright new silver dollar.

No one knows which day of the week the safety committee will make the visits. The cards are chosen at random, so everyone is eligible. The only way to win is to be wearing safety shoes when the committee visits.

According to the company safety director, the contest has a two-fold purpose. The man who wears safety shoes gets a prize, but the man who isn't wearing them learns from the committee what their advantages are. He is also shown where he can purchase them in the company warehouse, and told that they are available at cost.

Pallet Code Proposed

ASSERTING that standards for handling material are necessary to U. S. economy and defense, representatives of the armed forces, government departments and industry have voted to organize a committee to study and develop American Standards for pallets. Forty leaders of industry and government proposed that an ASA project be initiated to undertake the standardization of nomenclature, sizes, materials and components of pallets, including samplings, inspection and test procedures.

Safety & Production

(Continued from page 19)

Safety's second category of contributions to production is the lowering of the numerous indirect costs of accidents. All accidents delay work. Even the needed precautionary first-aid attention for a minor cut causes an interruption to production. In a serious accident time is lost not only by the injured employee, but also by other workers in the department or plant. A disabled employee requires a replacement. This involves costly training —in many cases resulting in waste of material and loss of production during the training period.

Another indirect cost of accidents that is often overlooked is the effect they have on the morale of other employees. Accidents and their causes, such as unguarded machinery, poor housekeeping, and poor employee-training have a depressing effect on every employee. They will in most cases greatly reduce his efficiency and may eventually cause him to look for another job—if he is lucky enough to escape death or disability long enough to do so.

Accidents Mean Inefficiency

These indirect costs have been variously estimated, and general statements about them may have little bearing on a particular plant's experience. However, the fact that indirect losses may be twice the direct losses or 10 times the direct losses is relatively unimportant. Much more significant is the fact that such losses are the price of lack of control. They are an index of inefficiency—a warning signal that something's wrong. Safety's third category of contributions to production is probably the most important of all. Little has been said about this aspect of safety. The emphasis has been upon the prevention of accidents, with its too frequent negative inference. It can be clearly shown that successful accident prevention is a positive contribution to the quality and quantity of production. Safety doesn't merely save something, or prevent something: it also adds something. Always keep this in mind: most accidents are symptoms of something wrong in the operation—some fault in design, equipment, arrangement, placement, training, supervision, operating procedure or practices. These basic causes of accidents are also the basic causes of inefficiency.

Safety means doing things the right way. The "one best way" that is the goal of efficient management and an adequate accident prevention program can accomplish these 8 worthy ends:

1. Reduce costly interruptions and delays.
2. Increase the productivity of workers.
3. Improve employee relations by affording a non-controversial ground for co-operation between management and labor.
4. Lift morale by increasing the desirability of the job.
5. Help in training of supervision to do a better job with its workers.
6. Increase loyalty of employees through the interest they develop in maintaining outstanding safety records.
7. Improve plant housekeeping, and
8. Help design more productive, efficient equipment and help lay out more efficient plants.

Safety programs based on these principles bring returns in dollars far greater than the savings which are the direct result of accident prevention. Let's elaborate upon these eight major production benefits which are gained through effective safety programs.

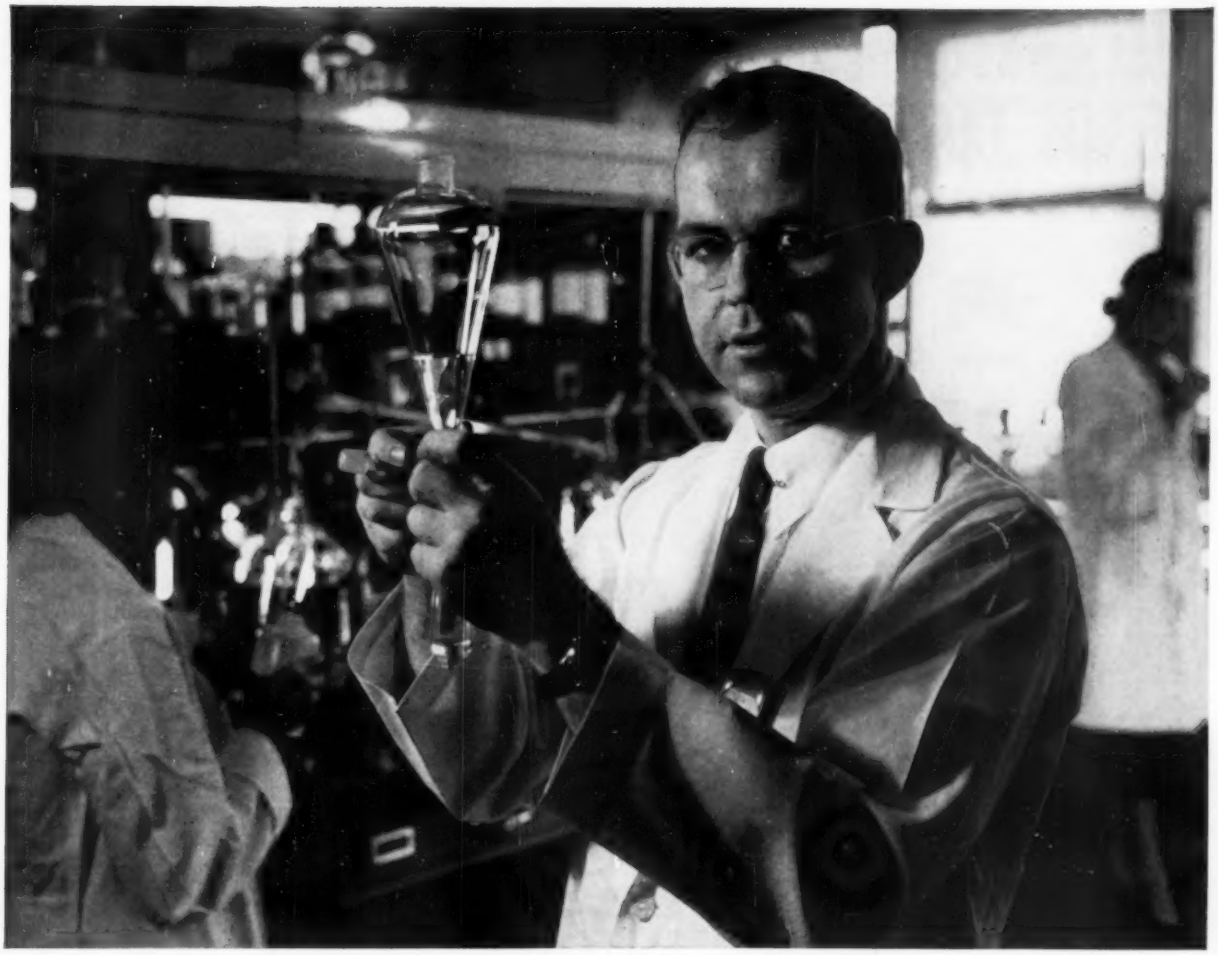
Many of the inspection programs and security devices that result from a safety program do more than prevent accidents. They also detect unsafe conditions that would cause breakdowns of equipment and thereby interrupt production. For example, relief valves on pressure vessels, primarily installed to provide safety, frequently aid the continuity of operations. Therefore, this one phase of safety work renders more efficient operations as a by-product.

Item number two is improvement in the productivity of workers. A good safety record depends upon every act of the workman being done in the right way. The right way—the safe way—is also the efficient way. In the effective safety program, the supervisor must properly instruct and train each worker in the correct way of doing the job. The correct way will prevent accidents. It will also result in less scrap, higher production, fewer damaged machines. Any man will be a snail if his job is dangerous. Self-preservation itself dictates that dangerous jobs be done slowly. In safety work great emphasis is put upon the proper placement of employees. This is especially true in the case of handicapped workers. But in any event, proper placement of employees is of great importance not only in safety, but also in efficient plant operations.

Point number three is improvement of employee relations. The participation of the employee and the foreman in accident prevention can be used to foster a better relationship. In our own plants, we encourage members of our supervisory staff to talk with each employee at least once a month on some specific aspect of our safety program. We require a tabulation of reports on these discussions. The participation of the employee in different aspects of the safety program gives him a feeling that he is "part of the team." And men who work together as a team for any common cause just do not get as bitter in their differences as they might otherwise. All those who hold supervisory positions should have in mind that a by-product of accident-prevention efforts, co-operation between employees and employers, helps maintain production at high efficiency.

Better Morale

Item number four is improvement in employee morale because of the increased desirability of their jobs. In some industrial plants the frequency of accidents is such that people work there only as a last resort. The inability to secure good workers for such plants greatly hinders production. From a posi-



PHOTOGRAPH BY RICHARD BEATTIE

What we still don't know about cancer

—and one of the reasons why

IN THE PAST FEW YEARS, our knowledge of the nature of cancer, and how to treat it, has grown encouragingly. Patients, who would have been considered hopeless cases even five years ago, today are being completely cured. And even those who apply for treatment too late can usually live longer—and less painfully—because of modern palliative treatment.

All the same, there have been defeats as well as victories. We do not know—to take a single example—why so many more men are now dying from cancer of the lung. In 1933—just twenty years ago—lung cancer killed 2,252 men; in 1953, some 18,500. That's a great increase—which even our expanded population, and other known factors, can't possibly account for in full.

Well, why haven't we found more of the answers to cancer?

Not only because cancer is an immensely complex problem: difficult to diagnose, and difficult to treat; challenging to the best research minds.

All that is true enough. But there is another reason: *we do not* have enough money.

Last year your gifts to the American Cancer Society were more generous than ever before. But they were not enough.

You gave the Society almost twenty millions to fight a disease that—at present death rates—will kill twenty-three million living Americans.

Less than one dollar for each American destined to die from cancer. Much more is needed for research, for education, for clinics. Won't you please do *your* part . . . now?

American Cancer Society

Cancer
Man's cruelest enemy
strike back
Give

GENTLEMEN:

☐ Please send me free information on cancer.

☐ Enclosed is my contribution of $..... to the cancer crusade.

Name.....

Address.....

City.....State.....

Simply address the envelope:
CANCER c/o Postmaster, Name of Your Town

tive standpoint, plants with good lighting, guarded machinery, good housekeeping, adequate medical facilities, and effective safety programs are plants where employees have a high morale and in general do efficient work.

Point number five—help in training supervision to do a better job with its workers—has been a big dividend of the safety program in many companies. Any effective safety training course must go far beyond the accident-prevention field itself and make the supervisory employee a better all-round member of the management team. You cannot assure safety merely by providing the best plant layout and safest equipment. A plant safety record represents the sum-total of the attitudes and worries and likes and dislikes of all the men and women who work there. When a supervisor appreciates this fact and is trained to foster attitudes of safety among the people he supervises—then he has learned also the principles of leadership.

Item number six, increased loyalty of employees through the interest that they display in outstanding safety records, is one more phase of accident-prevention work with a by-product that increases production efficiency. Outstanding safety records have been compiled by both plants and individual departments. The interest and pride employees develop in setting such records increase their loyalty to the company. It is also quite apparent that good, safe working conditions give the employee a sense of security against injury and time lost from work, and add to his pride.

Point number seven is improvement of plant housekeeping. Any sound safety program lays stress on good housekeeping. A trim and orderly plant is both safer and more efficient. And, where attention has been given to safety, you can count on improved appearance.

Item number eight is assistance in designing more productive equipment and in laying out more efficient plants. Proper ventilation, which carries off fumes, not only makes a work place safer. It also helps production. The substitution of a stairway for a ladder increases safety. It also provides for quicker, more economical movement of employees. A plant that is laid out with wide aisles for safer movement of materials is more efficient because it is possible to move materials with a minimum of interference.

Power presses that have been provided with guards and automatic feeds to increase the safety of the operation also give better production. The replacement of heavy hand lifting with mechanical-handling equipment eliminates strain on the human body and speeds the handling of materials. Many famous developments, such as the Westinghouse air brake, were originated principally for safety but have contributed greatly to efficiency of operation.

The fruits of an accident-prevention program are many and varied. Accident prevention is not window

BE FRESH...
STAY FRESH
wear a
DUPOR No. 1
miniature NOSE MASK for
Dust, Fumes, Paint Spray
Has 9 sq. in. filter. Mask is of soft rubber equipped with nose wire that's adjustable to any shape nose. Exhalation valve exhausts breathed air and keeps out unfiltered air. Handy as a pair of glasses. Complete panorama vision, no blind spots. Does not interfere with talking, eating, smoking. Fits the vest pocket. Weighs 1 oz.
Sample sent $1.20 pp
For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles..$2.00 pp.
H. S. COVER, South Bend, Ind.
(For full details, use Key # Q-22 on free Inquiry Card on page 83)

dressing. It is, in the very nature of things, an integral part of production. This seems very elementary but a great deal of confusion could be avoided if all managements recognized that safety "belongs" and is not merely a luxury to be indulged in only during prosperous times.

Safety is management's job. Management must furnish the drive. The existence of a thorough machine safeguarding program is the most eloquent evidence of management's sincerity in a safety program. It is eloquent because it is obvious to the employee. It is perhaps the best argument that can be offered in asking him to put his best foot forward in behalf of a safety program.

However, the majority of accidents cannot be prevented merely by placing guards on machines, or by designing safe machines. If this were so, devising an effective safety program would be a simple matter. The big job is to educate men and women to think in terms of safety, to teach them to recognize potential dangers and to avoid them. A safety program is a team project. A good quarterback—or safety engineer—is a "must." But the final score will be determined by the degree of enthusiastic co-operation—co-operation between every man on the team—foremen, supervisors and workers. As in any kind of work, the results are pretty much determined by the effort. No one can expect to have a good safety record unless he works for it. Above all, safety must be sold enthusiastically. If management does not demonstrate enthusiasm, it cannot expect to sell safety to employees.

When telling the human story of safety to our employees, make absolutely sure it is understood. Remember that new employees coming into plants each year are hearing industrial safety messages for the first time. So among every bored group that says, "Same old elephant," some eager voice will cry, "So that's an elephant." To some the safety story will be familiar, but it will stand repetition. To others, what is said is as interesting as an elephant

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MULTI-CLEAN *Method*

THIS ASPHALT TILE FLOOR, like thousands of others in offices, schools and factories is now under The Multi-Clean Method of floor care. That's why it's so bright, so clean, and so attractive . . . that's why people, who see it, say, "What happened to this floor? . . . How do you keep it so nice?

THE ANSWER IS ALWAYS THE SAME from the maintenance director of this large factory where there are 20,000 sq. ft. of new and old asphalt tile floors. "WE USE MULTI-CLEAN ASPHALT TILE PRESERVER and THE MULTI-CLEAN METHOD, and now have the safest, best-looking floors we ever had . . . yet we've cut maintenance time 65% and material cost 50% ."

THERE ARE MULTI-CLEAN FINISHES for every kind of floor . . . they go farther, last a long long time between applications, and you'll always find the floor protected by The Multi-Clean Method is far easier to clean and keep clean. Your nearby authorized Multi-Clean distributor will be happy to show you how to have better looking, safer working floors and save money. Call him or write us now!

FREE - Florule

"A GUIDE TO BETTER FINISHED FLOORS"

Select the floor, turn the dial . . . At a glance the Florule tells you what Multi-Clean floor treatment to use, how to use it and what it will do for your floor. Keep the Florule handy for ready reference.

MULTI-CLEAN PRODUCTS, INC.
2277 Ford Parkway, Dept. SP-4, St. Paul 1, Minn.

OK, I'd like one of these handy Florules, also information on The Multi-Clean Method for:

☐ Asphalt Tile; ☐ Wood; ☐ Concrete; ☐ Terrazzo;
☐ _____

Send details on: ☐ Floor Machine, ☐ Floor Scrubber; ☐ Vac.

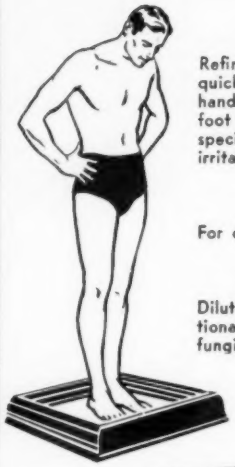
Name.....

Address.....

City.....*Zone*...*State*.....

(For full details, use Key # Q-23 on free Inquiry Card on page 83)

COMPLETE PROTECTION AGAINST
ATHLETE'S FOOT
at moderate cost!



IMPROVED ALTA-CO POWDER

Refinements and improvements now make ALTA-CO more quickly soluble, more agreeable generally and better to handle. Dissolved economically in water for the all-important foot bath, ALTA-CO kills *in less than a minute* all different species of fungi commonly found in Athlete's Foot. Non-irritating; harmless to towels.

ALTA-CO FOOT POWDER

For dusting feet after shower or other exposure to moisture.

H.D. FUNGICIDE FLOOR WASH

Diluted 1 to 300 in water, this powerful wash provides additional protection against Athlete's Foot on surfaces where fungi are commonly found.

Ask your DOLGE SERVICE MAN about money-saving offer on the DOLGE FOOT TUB.

FOR
FREE SANITARY SURVEY
OF YOUR PREMISES
SEE YOUR DOLGE SERVICE MAN

dependable
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"Simplest and Safest"

EMERSON
Resuscitators

SIMPLE to operate.

SAFE for adults, children, or infants.

ACCEPTED by the American Medical Association since 1942 for use *by laymen.*

PROVIDE SUCTION, alternating with pressure, to give vital aid to the circulation. Write for free *Medical References on Resuscitation.*

Gas poisoning (coal, illuminating, industrial, monoxide)
Asphyxia of new born babies
Hospital Emergencies

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J. H. EMERSON CO.
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(For full details, use Key # Q-25 on free Inquiry Card on page 83)

is to the kid who never saw one.

Let's take stock of what we have covered: the most important benefits of a safety program are the preservation of life and the prevention of suffering; the financial dividends which can be obtained from a safety program are several times greater than the expenditure required. They make it a wise investment for every industry; a well-conducted safety program improves the relationship between working force and supervisor and raises employee morale; a safety program must have the co-operation of all members—of top management, supervision and working force—before it can be made a success.

From an address presented at the Greater New York Safety Council, Dec. 1, 1953.

Comparison of Materials Topic of May Meeting

THE 3-day Basic Materials Conference will be devoted this year to a comparison of the properties and characteristics of materials in relationship to each other, it is announced by Clapp & Poliak, Inc., New York, producers of the conference. The conference will be held concurrently with the Basic Materials Exposition, the product development show, at the International Amphitheatre, Chicago, May 17-20.

"The purpose of the conference will be to acquaint executives with the relative advantages of using a particular material instead of another," says Saul Poliak, president. "A manufacturer who is undecided about the use of plastics, or wood, or steel, or rubber, or light metal for next year's model should find his answer either in the conference sessions or on the exhibit floor. The approach will be functional and comparative to permit the broadest possible base for a decision," Mr. Poliak continues.

T. C. DuMond, editor, "Materials & Methods," will be general chairman of the conference. Serving with him, on an advisory committee, will be a group of 18 scientists.

Advance registration cards may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N.Y.

Score Your Plant Housekeeping Contest Fairly and CLEAN UP!

THINKING of encouraging workers to keep the plant clean by running a contest? It can backfire if the scoring isn't fair, or doesn't seem fair to the workers. This problem has been solved by a unique descriptive inspection sheet, developed in the early weeks of a year-long "Operation Cleanup" contest at Elastic Stop Nut Corporation of America.

The setup calls for a team of foremen to make the inspections, and jobs on the team to be rotated frequently to give all the foremen a chance.

Various cleanliness categories are set up, such as "Overall condition of section," "Condition of floor," and "Wiping cloths, gloves, and rags." Inspectors grade each department on its condition in each category. Normally, the best scoring method would seem to be the use of numerical grades. Tell the inspector if the department is perfect to give it a score of 10, and if it is impossibly bad, score it zero. For cleanliness conditions in between, give scores somewhere between zero and ten. This seems logical enough, but it is actually a difficult method of scoring, and can lead to unfair comparisons between departments.

Categories

Apparently, a man without considerable experience can't measure relative cleanliness in terms of specific numbers. A cigarette butt on the inspection department floors is as noticeable as a neon sign. It wouldn't be so glaring in the screw machine department, and might not draw an equal deduction in points. And how many points should be deducted for a cigarette butt, anyway? How many for a few spilled nuts, or a dirty wiping rag tossed in a corner? The average man thinks in words: "good," "fair," "bad," or "dirty," "clean," "spotless." He finds it difficult to try to translate these terms into numbers. There's no scale against which to measure.

New Type Scoring

The solution is the new scoring sheet. After each category in which a score is to be indicated are 20 boxes, in groups of 3, 4, or 5. Each group of boxes is labeled with readily visualized terms, descriptive of the conditions the inspector sees. Each term describes a range of cleanliness. The inspector places the department high or low within the appropriate range by selecting the higher or lower boxes covered by the term.

INSPECTION SHEET
SHOP CONDITIONS

Section under Supervision of _____ Supervisor _____ Judge

Date _____

Overall Condition of Section	"Top Notch"	Tidy	Clean	Passable	Unsatisfactory
Condition of Floor	Can "Eat off It"	Shipshape	O.K.	Spotted with oil, papers, rags	Downright Dirty
Garbage, Scrap Cans	Mixed, overflowing, area dirty	Battered Cans	Tolerable	Good Condition	In place and spotless
Nuts, Pins, Scrap or Equipment Improperly on floor	Not a one	Scattered few	Quite a few	Too many for this section	Dangerous
Machine Accessories such as belts, guards, attachments, containers, tote bins.	Secure and orderly	In place	Need Attention	Dirty & dangling	Unattached & all over the area
Machine Tools & Gages	Nobody knows where they are	Dirty and out of order	Slightly scattered	In order	Where they belong and in top condition
Wiping cloths, gloves, rags	Clean & Tidy	Orderly	Slightly Tattered	Should be replaced	Draped on machines, benches, on the floor
Machine Condition	Spotless	Trim	Clean	Should be cleaned	Filthy
Bin stacking, Paper in Bins	Arrow and full of paper, rags	Below par for section	Orderly	Good "lineup" and Clean	"Apple pie" order
Raw material or parts improperly stored	Everything in order & clean	Good shape	Below par for section	Mediocre	Unsatisfactory and hazardous

Terms and Boxes

Under "condition of floor," for example, the inspector has these choices: "Can eat off it." "shipshape," "O.K.," "Spotted with oil, papers, rags," and "downright dirty." Under "Nuts on floor," he can indicate "Not a one," "scattered few," "quite a few," "too many for this section," and "dangerous." Now, "downright dirty" as a description of a floor is a pretty broad term. So above this term are 5 boxes. The inspector can check the right hand one if he thinks the floor is absolutely filthy. Or the left hand box if he thinks it is downright dirty but still not as bad as it could be. And he has 3 other boxes to indicate a condition between these extremes.

The contest operating committee, composed of supervisory and executive personnel, work out appropriate numerical scores to correspond to each box on the inspection sheet. These are lettered in proper position on a transparent sheet. Scores are read off the individual inspection sheets by a committee member, who lays the matching transparent sheet over the inspection sheet, and records the scores corresponding to the checked boxes.

Graph by courtesy of Elastic Stop Nut Corporation of America.

Ten Commandments of Safety

FOR SUPERVISORS

Your job in management places you in a unique position of trust. For not only does the company rely on you, as the direct representative of management, to apply its policies wisely and fairly; also entrusted to you is the obligation to safeguard the well-being of the workers in your charge. No responsibility transcends this in importance. In this respect your job is akin to the "stewardship" of biblical days: As a supervisor, you are indeed your brother's keeper.

On-the-job accidents represent a serious threat to the physical well-being of your men. Their prevention calls for your constant vigilance. Therefore, if you would guide your men safely through their daily work, be yourself guided by these precepts:

1. You are a supervisor and thus, in a sense, have two families. *Care* for your people at work as you would care for your people at home. Be sure each of your men understands and accepts his personal responsibility for safety.
2. *Know* the rules of safety that apply to the work you supervise. Never let it be said that one of your men was injured because you were not aware of the precautions required on his job.
3. *Anticipate* the risks that may arise from changes in equipment or methods. Make use of the expert safety advice that is available to help you guard against such new hazards.
4. Encourage your men to *discuss* with you the hazards of their work. No job should proceed where a question of safety remains unanswered. When you are receptive to the ideas of your workers, you tap a source of first-hand knowledge that will help you prevent needless loss and suffering.
5. *Instruct* your men to work safely, as you would guide and counsel your family at home —with persistence and patience.
6. *Follow up* your instructions consistently. See to it that workers make use of the safeguards provided them. If necessary, enforce safety rules by disciplinary action. Do not fail the company, which has sanctioned these rules—or your workers, who need them.
7. *Set a good example.* Demonstrate safety in your own work habits and personal conduct. Do not appear as a hypocrite in the eyes of your men.
8. *Investigate and analyze* every accident—however slight—that befalls any of your men. Where minor injuries go unheeded, crippling accidents may later strike.
9. *Cooperate* fully with those in the organization who are actively concerned with employee safety. Their dedicated purpose is to keep your men fully able and on the job and to cut down the heavy personal toll of accidents.
10. *Remember:* Not only does accident prevention reduce human suffering and loss; from the practical viewpoint, it is no more than good business. Safety, therefore, is one of your prime obligations—to your company, your fellow managers, and your fellow man.

By leading your men into "thinking safety" as well as working safely day by day, you will win their loyal support and cooperation. More than that, you will gain in personal stature. Good men do good work for a good leader.

—CHARLES P. BOYLE

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With Best Wishes

PERHAPS the anniversary of his birth on St. Patrick's Day had an indirect influence on the career of H. W. Beegle, who celebrated his 88th birthday on March 17th of this year. The "wearin' of the green" in the life of H. W. Beegle is particularly appropriate, as that color is associated in the public mind with safety, and Mr. Beegle is recognized as the dean of safety guard experts.

From the vantage point of a lifetime as a leader in the movement to safeguard workers against tragic accidents in industry, Mr. Beegle has had ample opportunity to initiate trends designed to further production and reduce losses through accident prevention. More than 40 years ago he recognized that loss of vision, mutilated hands and arms need not be accepted as an inevitable part of industrial production.

Personal investigation through the length and breadth of the country led to observations based upon practical experience rather than theory. As a result of these findings, he personally has been responsible for developing many outstanding, efficient guards designed to minimize danger and foster employee peace of mind.

As an exponent of eye safety, Mr. Beegle reminds us that structurally the human eye now used in industry is essentially the same as Adam's eye . . . it can see no better but it is protected to a far greater degree as an outgrowth of new hazards.

The larger plant, according to Mr. Beegle, is thoroughly familiar with the cost of eye accidents and injuries, while the smaller plant often considers that the insurance policy pays the entire cost of an eye accident. The small plant manager therefore must be shown that his losses caused by reduced output, cost of training a new competent replacement and paying for material spoilage will be many times the cost of compensation payments.

Mr. Beegle has found that so many major improvements in safety equipment have been made that it is possible to offer a guarantee that protective devices, when properly used, can result in an increase in man-day output and thus return better than 100 percent on the safety equipment investment.

Over long experience and a full, active career devoted to human welfare and life conservation, Mr. Beegle has become convinced that approved safety equipment will bring about better labor relations.

SAFETY MAINTENANCE joins with the host of friends of H. W. Beegle in wishing him many more years of active leadership in the field he has served with tireless energy and devotion.

H. W. Beegle

30 YEARS OF PROGRESS

GARDWELL 30th ANNIVERSARY

GARDWELL Products

Just as there have been big advances in aviation, so have there been advances in safety clothing and equipment — True they have not been as spectacular but they have been very effective.

New materials for clothing such as the various synthetics; new items such as plastic face shields; new ensembles like the asbestos suits for airplane rescue work, tunnel kiln servicing, etc. — these are just a few of the many advances in safety clothing and safety techniques.

You may be sure that *Safety Clothing & Equipment Co.* will be pioneers in every improvement that will give better protection and better service to the users of GARDWELL PRODUCTS.

WRITE FOR COMPLETE CATALOG

DEALER INQUIRIES INVITED

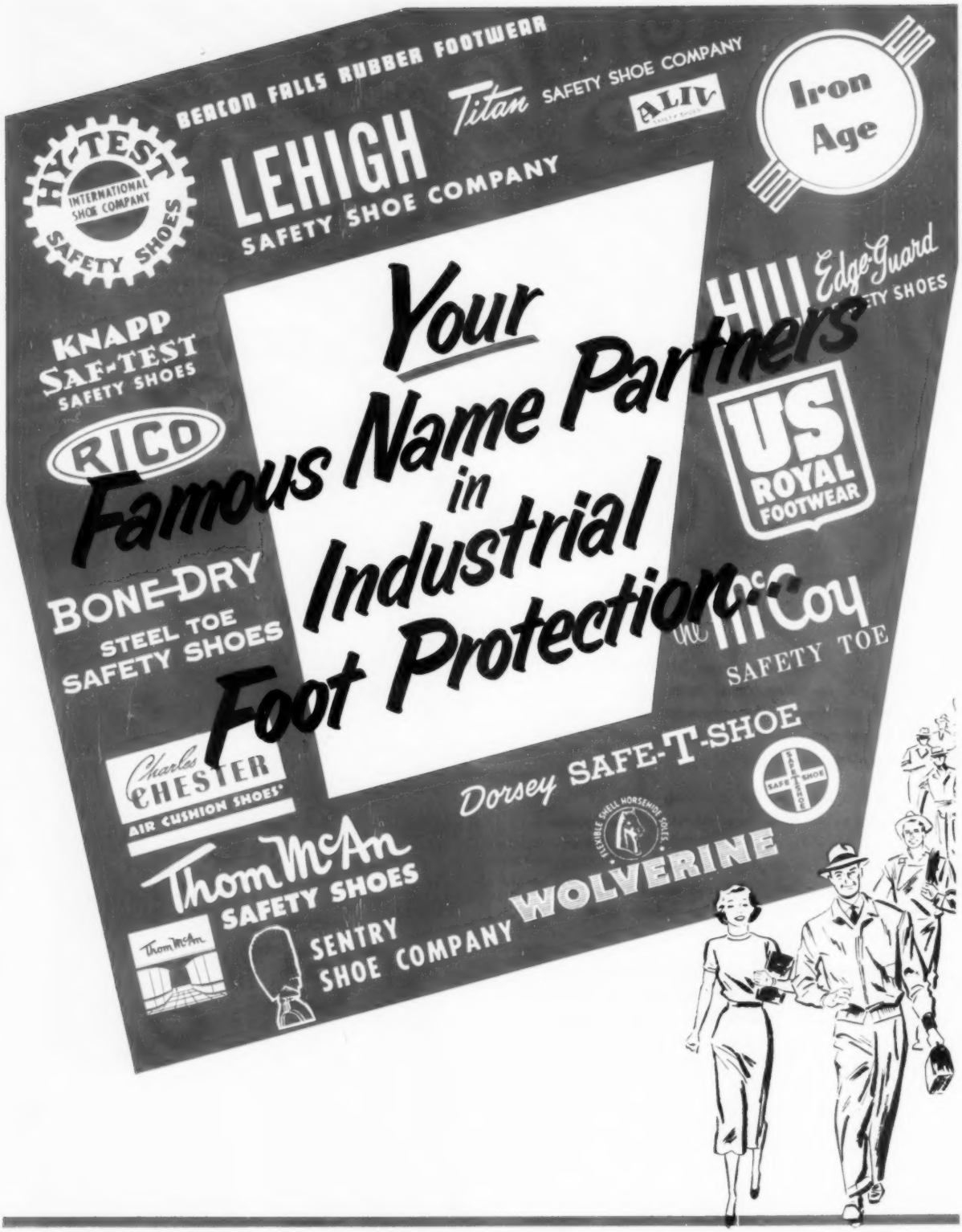
Safety CLOTHING AND EQUIPMENT Co.

DESIGNERS AND MANUFACTURERS

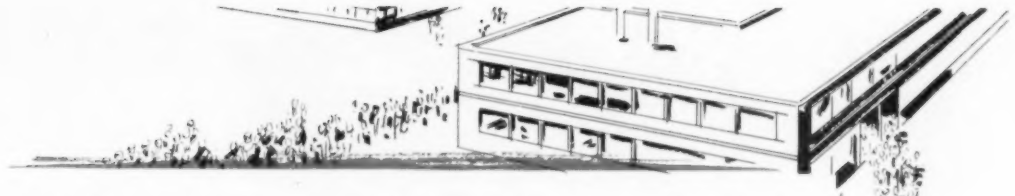
1990 EAST 69TH STREET • CLEVELAND 3, OHIO

PHONE HENDERSON 2-0400

(For copy of catalog, use Key # Q-26 on free Inquiry Card on page 83)



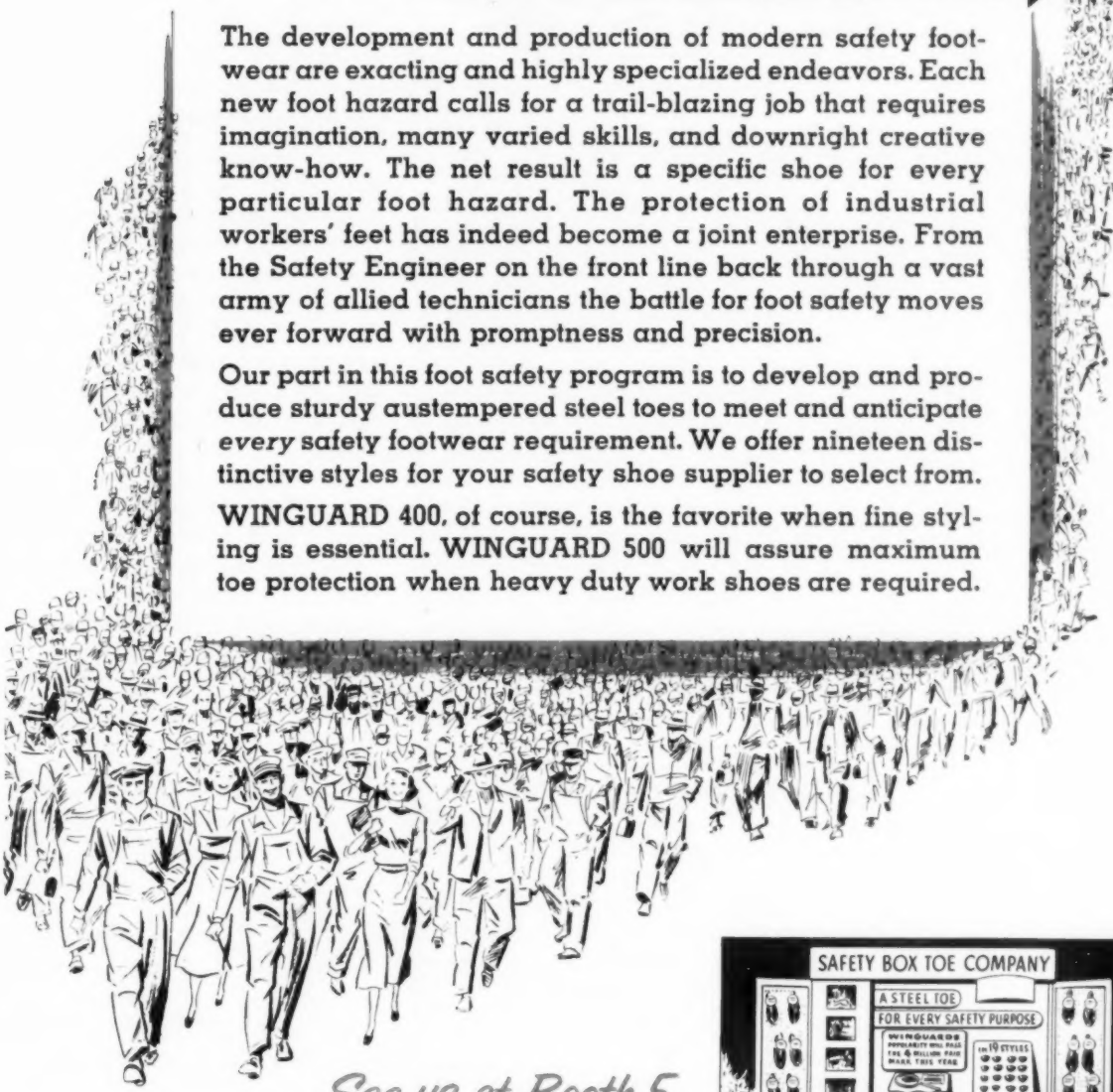
SAFETY BOX TOE COMPANY



The development and production of modern safety footwear are exacting and highly specialized endeavors. Each new foot hazard calls for a trail-blazing job that requires imagination, many varied skills, and downright creative know-how. The net result is a specific shoe for every particular foot hazard. The protection of industrial workers' feet has indeed become a joint enterprise. From the Safety Engineer on the front line back through a vast army of allied technicians the battle for foot safety moves ever forward with promptness and precision.

Our part in this foot safety program is to develop and produce sturdy austempered steel toes to meet and anticipate *every* safety footwear requirement. We offer nineteen distinctive styles for your safety shoe supplier to select from.

WINGUARD 400, of course, is the favorite when fine styling is essential. WINGUARD 500 will assure maximum toe protection when heavy duty work shoes are required.



See us at Booth 5

Greater New York Safety Council
24th ANNUAL
Safety Convention and Exposition
April 5, 6, 7, 8, 9, 1954

812 STATLER BUILDING • BOSTON

SELLING AGENTS: **BECKWITH MANUFACTURING COMPANY, DOVER, N. H.**

WRIGHT-GUHMAN COMPANY, ST. LOUIS, MO. BECKWITH BOX TOE, LTD., SHERBROOKE, P. Q., CANADA LENNART LJUNGQVIST, TIBRO, SWEDEN

(For full details, use Key # Q-27 on free Inquiry Card on page 83)

"What's the Law?"

Edited by
HENRY M. GROSMAN
Counsellor at Law, Newark, N. J.

Master Superior Court, New Jersey
Member
American Bar Ass'n, New Jersey Bar Ass'n,
National Federation Insurance Council
Past Commander, American Legion, Post 10,
Newark, N. J.

Questionable Electrocution

AN EMPLOYEE was asked by a fellow miner to help carry a "bonder," a small machine used in welding. The machine had metal handles on the front and back. The helper was on the front end and the employee who asked his help was on the back, where he was facing the former and could observe him at all times.

The room in which they were moving the machine was about 5 feet 9 or 10 inches high with a high voltage, unguarded trolley wire on the ceiling. The fellow employee did not see the first miner come in contact with the trolley wire, but after they had moved 8 or 10 feet, the miner slumped over and died a few minutes later. His fellow employee saw no sparks and smelled no burning flesh. There were no external marks or burns on his body.

Since there was no positive medical testimony that the decedent's death was caused by electrocution, it was held non-compensable.

(FLEMING v. PYRAMID COAL CORP., Indiana Appellate Court, No. 18, 171, October 2, 1951.)

Pre-existing Arteriosclerosis

This man was hired as a foreman assembler, and was unknowingly suffering from an advanced arteriosclerotic condition. While alone in the oven room, the employee allegedly moved an iron rail weighing several hundred pounds. This effort on the part of the employee induced a rise in his blood pressure and resulted in the perforation of a blood vessel.

He thereupon entered a boiler room and complained of a headache to two employees. Subsequently it was determined that the claim of injury was in reality a cerebral hemorrhage.

In his petition for compensation, the employee contended that the hemorrhage was occasioned by the oven room incident, and that the effects were displayed only after he had entered the boiler room. Expert medical testimony showed that a strain causing a break in the blood vessel would have caused an immediate collapse. Held non-compensable.

(FOLSOM v. MAGNA MANUFACTURING COMPANY, New Jersey Superior Court, Appellate Division, No. A 227-50, June 21, 1951.)

It is worth remembering that what would be a slight injury to a normal employee would be much greater to an unhealthy employee. With this fact in mind, employers should require pre-employment physical examinations of all prospective employees.

No Severe Strain or Sudden Effort

The Statute in the State of Mississippi requires that both severe strain or sudden effort and an incapacity to continue working be shown to the satisfaction of the compensation commission before an award is granted for hernia.

In this instance, the employee was hired to remove slabs from a conveyor belt, when he experienced a sting in the region of his left groin. It affected him throughout the day and he suffered severe pain that night. Because he was unable to find transportation to his job, he failed to report to work the following day. Upon reporting the day after that, he was informed that he was replaced. The employee stated that he was unable to work anyway and that he had returned to notify his employer of the injury. An examination of the employee disclosed a hernia condition.

The commission felt that he had not fulfilled the meaning of the statute and denied an award. On appeal the higher court made a more liberal interpretation and the employee was given the right to recover for his injury.

(LUCEDALE VENEER CO. v. ROGERS, Mississippi Supreme Court, No. 37,591, May 14, 1951.)

Dermatitis

In this case, an allergy which was contracted by a linesman continued to recur in subsequent employment.

The employee worked as a linesman for a construction company and after 11 days of employment, contracted a skin disease which was diagnosed as eczema, dermatitis or neurodermatitis induced by exposure to damp weeds and stagnant water. He recovered sufficiently to take another job with another construction company in the same capacity, as a linesman. After five weeks of work in the very same environment, he contracted the same malady. His petition was filed against the first construction company and he was paid 20 dollars a week for 20 weeks in addition to the medical expenses, but these were discontinued when he was declared cured.

The linesman again sought employment in a third company doing the very same type of work. He again contracted the dermatitis. He was told to stay away from damp weeds, dead water and creosote but disobeyed. As a result, the court held that his voluntary acts of disobedience broke the line of causation between the original and the

later attacks. Denied compensation.

(ERNEST WATERS CONSTRUCTION COMPANY v. MILLS, Florida Supreme Court, No. 21,609, March 9, 1951.)

No Safety Devices—Additional Compensation

A painter was engaged in sanding and priming the inside of the door to an elevator shaft, and while in a squatting position stepped backwards, fell down the shaft from the second to the first floor and was injured.

A claim for compensation, plus 50 percent additional compensation based on the failure of the employer to furnish reasonable safety devices, was filed by the injured painter. The trial court found that the employer failed to furnish reasonable safety devices, and in particular did not barricade elevator shafts as is customarily done for the protection of workmen and the public.

The employer charged that the employee was guilty of contributory negligence in falling down the shaft; but contributory negligence has no place in the Workmen's Compensation Act, unless the employee failed to observe a statutory safety regulation or failed to use a safety device furnished by the employer. The employee's claim was upheld.

(WRIGHT v. SCHULTZ, New Mexico Supreme Court, No. 5371, May 8, 1951.)

New Publication On Basic Materials

PUBLICATION of "Materials for Product Development—1953," the text of discussions at the first Basic Materials Conference is announced by Clapp & Poliak, Inc., New York 17, N. Y. for $7.50, postpaid.

The book contains discussions of modern materials now available for the production of goods. Papers range from discussions of the newest kinds of materials, such as radioactive materials, titanium and zirconium, to new applications of such staples as steel, ceramics and wood.

Again ZORBALL proves to be best floor absorbent!

C. E. Brown, superintendent of Base Services, Pacific Airmotive Corp., Chino, Calif., prefers WYANDOTTE ZORBALL to any other floor absorbent. Here, in his own words, are his reasons—

Skidproof, nonflammable ZORBALL *being spread over oil spillage at Pacific Airmotive Corp.*

"Zorball is preferred over competitive products at P. A. C. because:

1. It does not track thru the hangar and aircraft during work process.
2. Clean, easy to handle.
3. Better absorbent qualities. Requires only *one* sweeping to effectively pick up oil and grease, as opposed to two sweepings with competitive products.
4. Even in California rains, ZORBALL when wet doesn't stick to worker's shoes. Hence, doesn't track into aircraft."

Thank you, Mr. Brown. Oils, paints, chemicals, water—ZORBALL absorbs them all without mudding, caking or dusting. Even after hard use, or when saturated, ZORBALL remains skidproof . . . always nonflammable. Beyond doubt, WYANDOTTE ZORBALL is the safest, lowest use-cost all-purpose floor absorbent you can use!

Mail coupon today for data or free sample

Wyandotte Chemicals Corporation, Wyandotte, Michigan

Send free data ☐
or free sample ☐
of skidproof, nonflammable ZORBALL

Name_____
Firm_____
Address_____
City_____ Zone____ State_____

(For full details, use Key # Q-28 on free Inquiry Card on page 83)

INSIDE THE TRADE

Wyandotte Chemical Appointment

APPOINTED Manager-Government Sales Department by Robert L. Reeves, Vice President-Sales of the J. B. Ford Division of Wyandotte Chemicals Corporation is M. E. Powers. Mr. Powers will supervise the selling of laundry detergents and alkalies, aircraft and ordnance metal cleaning products, paint strippers, tank desealants, deicing solutions, dishwashing products, maintenance and general cleaners, germicides, insecticides, and specially formulated alkaline materials to all government agencies. He will headquarter at Wyandotte, Michigan, and will work closely with the personnel of the new Wyandotte Chemicals Research Center in the development of products to meet military specifications.

Huntington President Gets National Safety Post

PRESIDENT of Huntington Laboratories, Inc., Huntington, Indiana, J. L. Brenn, has been appointed a member of the Research Committee of the President's Conference on Occupational Safety.

The basic purpose of the Conference is to promote safety in the construction, manufacturing, public utility, trade, service and governmental classification of industry. It draws upon the nation's safety talent to make available to all the latest and most effective safety methods.

I KNOW I'M SAFE...
with WOODEN SOLES!
Wooden Soles Insulate
Strong steel toe
FOR THE FACTORY...
No. 504-S Sizes—5-13
Wear a Reece "Strong Toe." Comfortable leather uppers. High, roomy steel toe protector, heat-resistant wooden sole. Have comfort-safe feet at work in oil refineries, foundries, steel mills, factories.
No. 351
...FOR THE FOUNDRY
An improved Reece "Hot Foot" Sandal with two strong sole leather hinges provides real insulation for those hot jobs. Straps on quickly over any shoe . . . it bends.
Sizes—Small-Medium-Large.
WRITE FOR CATALOG
There is no substitute for Reece Wooden Soles
REECE WOODEN SOLE SHOE CO.
Dept. SM 4
Columbus, Nebraska
(For full details, use Key # Q-29 on free Inquiry Card on page 83)

Penn. Optical Appoints

THE Pennsylvania Optical Company of Reading, Pennsylvania, manufacturers of head and eye protective equipment, have announced the following sales appointments:

Mr. Edward L. Clark to serve the Cleveland area with headquarters at 6318 Thornton Drive, Parma 29, Ohio. Formerly Safety Director for the Edgewater Steel Company, Mr. Clark is a member of the American Society of Safety Engineers.

Mr. Robert Speidel to serve the Detroit area from his headquarters at 22150 Westhampton Avenue, Oak Park, Michigan. Mr. Speidel has had broad experience in the safety field, is a graduate of Fenn College with a B.A. in Business Administration.

Catalytic Scientist Honored

CATALYTIC scientist, Eugene J. Houdry, has been presented with the John Scott Medal Award by the Board of Directors of City Trusts of Philadelphia.

The Scott Award—a copper medal, a scroll and 1000 dollars—was created by a Scottish chemist in 1816 "for ingenious men and women who make useful inventions." Mr. Houdry received it in recognition of his achievements in the catalytic cracking of petroleum.

Mr. Houdry's company, Oxy-Catalyst, Inc., which manufactures oxidizing catalysts for control of air pollution and heat recovery, has recently appointed Nicholas F. Pensiero, former Air Force supply officer and RCA Victor executive, head of the company's New Products and Market Research Division.

Mr. Pensiero, a native of Philadephia, was educated at LaSalle College, in Philadelphia, graduating magna cum laude with a B.S. degree in business administration in 1940.

He joined the RCA Victor Division in Camden, N. J., the same year as a junior accountant. Two years later, as a second lieutenant in the Air Materiel Command in Dayton, Ohio, he received the Legion of Merit for setting up supply procedures on the West Coast.

From 1946 to 1951, during which time he switched to sales, Pensiero was back with RCA Victor in Camden. He was manager of the Employee Sales Division when the Air Force recalled him in July of 1951. When he was separated again from the Air Force with the rank of major, he was in charge of developing world-wide Air Force requirements for general spare parts supplies.

Back at RCA again, Pensiero was made manager of the Tape Recorder Marketing Group, a job he left to join Oxy-Catalyst, Inc.

Automatic Sprinkler Association Meeting

THE 40th annual meeting of the National Automatic Sprinkler and Fire Control Association was held recently in New York. The officers elected for the present year are: President, John J. Power, Jr., Executive Vice-President, "Automatic" Sprinkler Corp. of America, Youngstown, Ohio; First Vice-President, Frank J. Fee, Jr., President, Reliable Automatic Sprinkler Co., Inc., Mt. Vernon, N. Y.; Second Vice-President, Ray B. Heath, Vice-President and General Sales Manager, Rockwood Sprinkler Co., Worcester, Mass.; Secretary-Treasurer, Miss Anna D. Bosch; and Assistant Treasurer, A. G. Woelfel, President, H. G. Vogel Company, Ridgefield, N. J.

A. M. Lewis, President of the Globe Automatic Sprinkler Company, New York, will continue to serve as Chairman of the Executive Committee. The other members of this committee are: The President and Vice-Presidents of the Association together with Past Presidents O. L. Swats, Manager of the Fire Protection Division, Grinnell Company, Inc., Providence, R. I. and T. Seddon Duke, President, Star Sprinkler Corporation, Philadelphia.

Do You Have A DERMATITIS PROBLEM?

Are you a PAINT MANUFACTURER?
Do your men get rashes from solvents?
Try LIXOIL for *removing paint.*

Do you run a MACHINE SHOP?
Do your men get costly oil eruptions?
Use LIXOIL as a preventative.

Do you make TAR or PITCH?
It is removable with Lixoil, *without irritation.*

Do you manufacture PUTTY or CAULKING COMPOUND?
Lixoil removes it easily.

Do your workers have trouble in getting SILICONES off the skin?
Lixoil removes them very simply.

Are your workers as clean as the product that you sell?
Try LIXOIL to get them that clean, and SAVE INSURANCE COSTS.

For Sample and Literature, *write*

LIXOIL LABORATORIES

P. O. BOX 35, BOSTON 31 ROSLINDALE STATION **MASS.**

(For full details, use Key # Q-30 on free Inquiry Card on page 83)

SURETY'S SURESEAL INDUSTRIAL GLOVES

TURN-CUFF OR STANDARD GAUNTLET

- 10 Times higher abrasion resistance in standard abrasion tests.
- 4 Times higher snag resistance in standard puncture tests.
- Turn Cuff style with no drip feature and 2 inch longer gauntlet.
- Surety's Sureseal synthetic rubber gives much higher resistance to industrial chemicals than either natural rubber or standard synthetics.

Phone your jobber or write direct.

THE SURETY RUBBER CO. CARROLLTON, OHIO

IN CANADA Safety Supply Co., Toronto, Ont.

(For full details, use Key # Q-31 on free Inquiry Card on page 83

Towmotor Distributor Appoints

THE naming of Arch R. Smith as Vice President and General Manager of the Grand Rapids branch of The Frank Colker Co., Detroit distributors for Towmotor Corporation, has been announced by Frank Colker, President.

Mr. Smith brings to Grand Rapids and Western Michigan 31 years experience in the industrial truck field. Until his recent appointment, he was Executive Vice President and General Sales Manager for the Ready-Power Company, Detroit, which he joined in 1935. According to Towmotor Corporation, Mr. Smith's appointment is the first step in an intensive program of expansion for the entire distributor organization, having maximum customer service as its objective.

Clean...Dry...*Slip-safe* Floors IN JUST 90 SECONDS!

The picture tells the story! Two men operating as a team with HILD Equipment can *scrub and dry* floors under and around machines...while operator steps aside for 90 seconds or less. HILD Equipment goes right to the edge of machinery...leaves no slick film to cause slip hazards. The same equipment may be used with numerous attachments to perform scores of clean-up jobs in factory and office.

Write for FREE CIRCULAR

ONLY HILD HAS THE PATENTED SHOWER-FEED BRUSH
Refillable, when bristles become worn, by merely attaching new refill block. It's done with a screwdriver in 5 minutes or less.

HILD System
MAINTENANCE EQUIPMENT & SUPPLIES

HILD FLOOR MACHINE COMPANY
740 W. Washington Blvd., Chicago 6, Ill., Dept. SMP-4
Factory Branches
250 E. 43rd St., New York 17, N.Y.
4271 W. Third Ave., Los Angeles 5, Cal.

(For full details, use Key # Q-32 on free Inquiry Card on page 83)

Clark Equipment Revamps Eastern Organization

CLARK Equipment Company has revamped its dealer organization in the east to handle its newly-acquired Ross straddle carriers and fork truck lines, according to W. E. Schirmer, vice president. Clark dealers affected by the plan are Materials Handling, Inc., Pittsburgh, Pa.; Fallsway Spring and Equipment Company, Baltimore, Md.; C. E. Reutter Corporation, New Haven, Conn.; Rushmore, Weber and Case, Inc., Latham, N. Y.; and Brodie Industrial Trucks, Inc., of Malden, Mass., and Buffalo, N. Y. Under the new plan Clark dealers will add Ross products to their regular sales and service activities.

30th Anniversary for Safety Clothing & Equipment Company

THE 30th Anniversary of the founding of the Safety Clothing & Equipment Company, 1990 E. 69th St., Cleveland, Ohio is being celebrated.

Designers and manufacturers of safety clothing and equipment for the industrial worker, the company makes protective garments such as aprons, sleeves, mittens, leggings, gloves, clothing, blankets and curtains from asbestos, fireproofed duck, leather and other fireproofed materials.

Fyr-Fyter Has New President

EXECUTIVE Vice President and General Manager of The Fyr-Fyter Company since 1948, Don O. Wood has been elected President of the Fyr-Fyter Company and a member of its Board of Directors, according to an announcement made by William M. Wetzel, Chairman of the Board.

Mr. Wood joined the Fyr-Fyter Company 31 years ago. Starting as an office boy, he progressed through the company's Service and Sales Divisions, serving both as Service and Sales Manager over a number of years.

The Fyr-Fyter Company, Dayton,

Ohio, manufactures a complete line of fire extinguishers and includes all the accepted types of chemicals such as carbontetrachloride, CO_2, dry powder and its "Instant" extinguisher using an exclusively patented chemical. The company also operates a division at Wooster, Ohio, for fire hose nozzles, hose couplings and other brass goods.

Bullard Appoints West Coast Manager

PRESIDENT E. W. Bullard, of the E. D. Bullard Company, San Francisco announces that Joseph L. Polizoto has been appointed manager of the firm's Los Angeles Office.

Mr. Polizoto has been associated with the company since 1934 where he started in the shipping department. He was made assistant manager of the Los Angeles Office at 6719 South Figueroa Street, in 1942.

The E. D. Bullard Company is one of the nation's oldest manufacturers of industrial safety equipment. The company pioneered industrial head protection, web safety belts, safety hooks, and many other items designed to save lives and prevent industrial accidents.

Scott Sterling Retires

LONG recognized by scores of leaders throughout the optical industry as the "dean of ophthalmic lens research," Scott Sterling has retired from Bausch & Lomb Optical Co.

At a farewell dinner in his honor Mr. Sterling was cited by research associates and company officials for his many valuable contributions to eyeglass lens design during his 33-year career. Born at Lawrence, Kan., Mr. Sterling graduated from Yale University in 1910 with an A. B. Degree in physics and mathematics. As a teacher on an Indian reservation in northern Nevada and later as a California high school principal, he became interested in the visual problems of many of his pupils. To further his knowledge in optics, he did graduate work at the University of California before joining Bausch & Lomb in 1954.

DAVIS HIGHWAY FLASHER

—visible for over a mile in either direction

The modern, *safer* highway warning flasher . . . for maximum impact on traffic, maximum protection for men working on the highway. Stands 8 feet high . . . can be seen over passenger cars. All parts repairable and replaceable in the field. Runs on No. 487 batteries . . . costs less than fuel and labor to maintain old-fashioned, undependable oil lanterns and pot flares. Collapsible, portable.

Two reflectors available: 360° Fresnel lens, and uni-directional reflector (shown in circle).

- **Flashes red or white • Adjustable rate of flash**
- **Easy to maintain in field**
- **Continuous 24-hour service for a full month on one set of batteries.**

Write for Bulletin No. 1408

SAFETY DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.
64 HALLECK STREET, NEWARK, NEW JERSEY

(For full details, use Key # Q-33 on free Inquiry Card on page 83)

NOCON SAFETY SOLVENTS

NOCON

—REPLACE—
CARBON TETRA-CHLORIDE

TYPES — E, F, G, H FOR SAFETY
Rapid drying Safety Solvents with flash points as high as 235; Low Toxicity, Non-Corrosive. For cleaning electric motors, equipment, etc.

TYPES — 325-490 NON-COMBUSTIBLE
Drying speeds up to twice as fast as Carbon Tetra-Chloride, Non-Toxic, Non-Corrosive, 100% Non-Combustible.

NOCON PRODUCTS CORP.
62 WILLIAM STREET NEW YORK 5, N. Y.
Write for Technical Bulletins

(For full details, use Key # Q-61 on free Inquiry Card on page 83)

Bump that assures positive results

When fire strikes, seconds count . . . your fire extinguishers must be the right type and function properly from the very start . . . failure means serious losses.

The growing popularity of the highly effective powdered dry chemical fire extinguishing agent may be hampered by a drawback . . . settling or packing can occur after a lapse of time. However, with C-O-TWO Dry Chemical Type Fire Extinguishers there's no chance of this happening.

The exclusive inverting and bumping design of C-O-TWO Dry Chemical Type Fire Extinguishers provides mechanical breakage of the dry chemical by shifting its position in the cylinder. This outstanding mechanical breakage, plus continuous inert gas pressured agitation or fluffing of the skillfully blended free flowing dry chemical, guarantee lasting, foolproof fire protection.

No other brand on the market today gives you this extra margin for positive results. Inverting and bumping is only one of many unique design advantages that make C-O-TWO Dry Chemical Type Fire Extinguishers your best buy for killing flammable liquid and electrical fires, as well as surface fires involving ordinary combustible materials.

With C-O-TWO Dry Chemical Type Fire Extinguishers the heat-shielding dry chemical is a non-conducting, non-abrasive, non-toxic, finely pulverized powder compound . . . blankets fire instantly. Sizes range all the way from 4 to 150 pounds capacity . . . all fully approved by the Underwriters' Laboratories, Inc., Factory Mutual Laboratories and Government Bureaus.

Act now for complete free information on these top quality, sure-acting fire extinguishers. Remember fire doesn't wait . . . get the facts today!

C-O-TWO

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

(For full details, use Key # Q-34 on free Inquiry Card on page 83)

Napalm Gel Fires

THE successful use of dry chemical fire equipment to extinguish Napalm Gel fires has been reported to Ansul Chemical Company. Napalm Gel is used in incendiary and anti-personnel bombs.

A Norwegian distributor has reported that several small test fires were extinguished with a 30-pound dry chemical hand extinguisher under different conditions without difficulty.

A final test was conducted, he said, on two wooden walls each about twelve feet high and eighteen feet long, forming a corner, with a roof overhead and wooden shelves inside. Some 250 liters of Napalm Gel was splashed over the wooden material and on the grass around the building.

The fire was permitted to burn until the structure was completely afire. Then it was extinguished in approximately two minutes with a 350-pound dry chemical apparatus mounted on a truck.

Specifications For Fire Department Apparatus

UNTIL recent years, much fire apparatus was selected and purchased on the basis of an inspection of apparatus in service in nearby municipalities, the reputation of a manufacturer, the claims of a sales representative, the testimony of satisfied purchasers of similar apparatus, or even on the basis of attractive or distinctive appearance. The modern practice in use by all progressive departments and municipalities is to specify the features desired and ask for bids to furnish apparatus to comply with these requirements, according to a recent bulletin of the National Board of Fire Underwriters.

This method is known as purchasing by competitive bids based on adequate specifications. It is the method employed by leading buying agencies and is required in most purchases of the Federal Government. It is designed to eliminate favoritism or personal influence, insure delivery of equipment which will perform satisfactorily and provide the purchaser with maximum utility and value for the money expended.

However, such benefits are only realized through the establishment of proper standards; the apparatus will be no better than the specifications. Few municipalities are able to employ personnel with the qualifications and ability to draw up specifications which would cover adequately all phases of construction and performance of fire apparatus. Frequently, in attempting to draw up adequate specifications, the result becomes so excessive or restrictive in some requirements as to increase the cost unnecessarily or prohibit bidding entirely. Often important requirements are omitted.

Fortunately, this problem has been realized by responsible authorities and complete modern specifications are available to all persons or municipalities desiring to use them. For this purpose, a committee of well-qualified persons with a personal and professional interest in this phase of the fire protection field has been formed by joint action of the National Board of Fire Underwriters, International Association of Fire Chiefs and the National Fire Protection Association. Membership is composed of municipal fire chiefs, apparatus manufacturers, municipal fire protection engineers of the insurance industry and qualified representatives of government and educational organizations. The specifications are available in pamphlet form from the National Board of Fire Underwriters and in pamphlet and loose-leaf form from the National Fire Protection Association. The NBFU pamphlet is entitled "Suggested Specifications of the National Board of Fire Underwriters for Motor Fire Apparatus, as recommended by the National Fire Protection Association and approved by the International Association of Fire Chiefs," NBFU Pamphlet No. 19.

Basic Specifications

These specifications are complete except for such items as the capacity required in pumpers, the length of ladders on ladder trucks, and other items which vary according to local conditions of operation or preference. Such items are inserted on the form sent by the purchaser to the manufacturer together with any other design modifications desired. A supplementary list of basic equipment is provided for purchasers to add to the contract specifications if desired.

The basic requirements of motor fire apparatus are similar to those of commercial trucks. For this reason,

GREATER PERSONNEL PROTECTION THAN EVER BEFORE

safety engineers, industrial hygienists, industrial engineers and production men are

*REPLACING CARBON TETRACHLORIDE

with FINE ORGANICS' 'SAFE-TEE' SOLVENT

F.O.-128

(low toxicity—high flash)

and are safe-guarding personnel from nausea, vomiting, abdominal cramps, headaches, dizziness, jaundice, loss of memory and the more harmful effects on the lungs and the liver.

Combined with the exceptional safety features is the extreme **CLEANING AND DEGREASING** effectiveness of **F.O.-128.**

ADVANTAGES OF F.O.-128

- Minimized toxicity — fifteen times more safe than carbon-tetrachloride.
- High flash point reduces fire hazards.
- Will not produce dermatitis.
- Perfect for cleaning electrical and mechanical equipment without damage to surfaces or insulated components.
- Zero residue on drying.
- May be used in process cleaning for pre-paint or pre-plate operations.

WRITE TODAY for information on this and other FINE ORGANICS' "SAFE-TEE" Solvents. *Representatives in Principal Cities:*

*See July 1952 issue of *Industrial Hygiene and Occupational Medicines*

Write to Dept. "B" for FREE technical bulletin "How to Clean Electric Motors."

AVIATION-INDUSTRIAL DIVISION

FINE ORGANICS, Inc.

211 East 19th St. • New York 3, N. Y.

(Use Key # Q-35 on Inquiry Card on page 83)

much of the apparatus purchased today, especially of smaller capacities, consists of pumps, water tanks and other equipment mounted on a commercial truck with a specially designed body.

Pumping Requirements

Each make and model of pumper, when proper data are submitted and appropriate tests are made, is listed by the National Board of Fire Underwriters as meeting minimum requirements of pumping capacity. This listing does not certify compliance with all items of the "Suggested Specifications for Motor Fire Apparatus." Such compliance with specifications can only be determined by the purchaser upon delivery of the apparatus. In addition, a three-hour acceptance test should be run to verify the pumping performance and operability of the apparatus.

Listing by the National Board of Fire Underwriters does not insure that apparatus will deliver required capacity at elevations substantially above sea level nor that the apparatus will perform satisfactorily under all conditions of climate, terrain or topography. The brake horsepower used for listing is of the engine without accessories, tested by dynamometer; actual available maximum brake horsepower will be less than this amount and will vary depending upon the size and type of accessories, such as electric generator, alternator, fan, air-cleaner, carburetor or muffler, installed on the apparatus.

Maintenance

However, this listing does not guarantee continued delivery of rated capacities and pressures throughout the normal life of the apparatus without regular and complete maintenance. It is the duty of the purchaser to specify the performance conditions other than pumping ability which must be met, including the altitude at which performance is expected.

Fire Losses Continue Climb

Estimated fire losses in the United States during January amounted to $86,493,000, it was reported recently by the National Board of Fire Underwriters.

According to Lewis A. Vincent, NBFU's general manager, this $86,493,000 loss represents an increase of 12.8 per cent over losses of $76,659,000 reported for January, 1953, and an increase of 3.7 per cent over losses of $83,440,000 for last December (1953).

These estimated insured losses include an allowance for uninsured and unreported losses.

UP! UP! UP!

Month	1954	1953	1952
January	$86,493,000	$76,659,000	$74,155,000
February		72,706,000	69,925,000
March		83,471,000	72,254,000
April		67,362,000	67,380,000
May		64,239,000	62,354,000
June		67,644,000	58,585,000
July		74,938,000	61,675,000
August		107,713,000	56,462,000
September		68,613,000	58,949,000
October		68,551,000	63,958,000
November		68,064,000	65,129,000
December		83,440,000	74,127,000
TOTAL		$903,400,000	$784,953,000

Fire Training School

A RECORD number of eleven industrial Fire Training Schools will be held during 1954 on the fire test field of the Ansul Chemical Company at Marinette, Wis. Each school will last three days, the starting dates being May 24; June 14, 21, 28; July 19, 26; August 16, 23, 30; September 13, 20.

The school is held for the purpose of training plant fire marshals, safety directors, fire brigade leaders and military and municipal fire suppression officers in the latest techniques of extinguishing fires with dry chemicals. The students then return home better equipped to train personnel under them.

Last year, 225 persons attended nine schools, the largest proportion of enrollees coming from the metal fabrication, chemical, petroleum, gas, steel, electrical, railroad, aviation, paper, transport, food and mine industries. There also were a considerable number of representatives of municipal fire departments and the U. S. and Canadian military services.

Registration is limited to 25 men for each school, with reservations accepted on a first-come, first-served basis. Ansul provides all instruction and use of equipment free of charge, the students paying only for their transportation and living expenses while at Marinette.

Classes are held on the company's eight-acre fire test field, which is capable of simulating every type of fire found in industry. Students are taught to use hand, wheeled and large stationary units of dry chemical equipment against flammable liquid and propane gas fires of all sizes and types.

Other types of extinguishing agents also are available in case any student has a special fire problem.

In addition to the field work, the schedule calls for group discussion periods, showing of fire-fighting motion pictures, and a brief plant tour to show how fire extinguishers are manufactured.

Address inquiries to: Customer Training Fire School, Ansul Chemical Company, Marinette, Wis.

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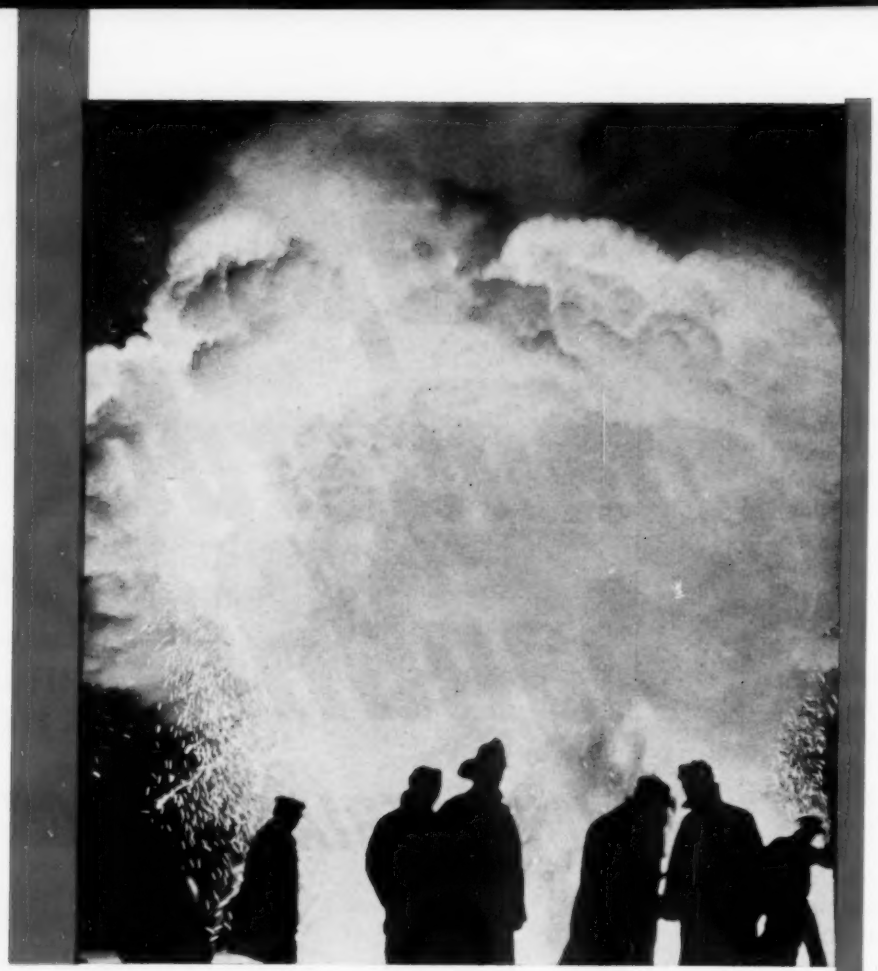

Another Warehouse Burns Up

Why?

DURING 1951 and 1952 warehouse fires with losses ranging from $100,000 to over $5,000,000 occurred with a frequency of almost one per week. The contents losses were three times the building losses and amounted to as much as $800 per square foot. A study of some of the fire reports reveals many of the inherent faults which have led to these losses, according to a bulletin of the National Board of Fire Underwriters.

The storage of large amounts of combustible materials in noncombustible buildings has often resulted in unjustified complacency. Crude rubber burning in an Ohio warehouse presented an example of a fire in such a structure. Firemen fighting the blaze were seriously handicapped by the sudden collapse of the steel deck roof and the unprotected steel columns. However, in another fire in a fire-resistive warehouse of reinforced concrete construction, rubber tires burned for 14 hours but the building columns continued to support their loads.

The problem of large fire areas is well illustrated in a fire which destroyed an extensive warehouse containing vacuum cleaner parts. A fire area of nearly 64,000 square feet was produced by roofing over the space between two separate warehouses. All door and window openings between the areas were left open and unprotected. Fire, starting in a pile of rubber hose in the center area, flashed over the pile of stock, caused collapse of the roof, and spread to the other sections.

A Chicago warehouse fire which resulted in a total loss, was reported as "the worst kind of fire to fight because we couldn't get at it. There were no windows in the two end walls of the building." Without access to a fire, firemen cannot control it.

Poor Storage

The need for efficient use of space has led to storage practices which have proved to be hazardous. In

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MORE EFFECTIVE... MORE DEPENDABLE

FIRE-STOPPING POWER

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Chemical Company
FIRE EQUIPMENT DIVISION • MARINETTE, WISCONSIN

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used to protect machinery, and other equipment from water, dust and snow.

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one warehouse bales of wastepaper were piled to a height of 30 feet in a high, one-story building. Fire is believed to have originated spontaneously; it burned for several days despite the operation of automatic sprinklers and hose streams. In Philadelphia a 100-year-old warehouse collapsed and burned destroying 2 million pounds of rubber. Storage in the five-story structure was crowded, without aisles. Collapse of floors from overloading is believed to have started the fire.

Aisles are necessary not only for operation but also as means of access in time of fire. A sugar warehouse in Wyoming contained 89,980 bags of sugar piled in a closely arranged block to the peak of the roof. The only aisle was a continuous one around the outside wall. When a fire was discovered in the sugar, the only way that members of the plant fire brigade could attack it was through a hole chopped in the roof.

Fire in a seven-story paper storage warehouse in New York showed the need for clearance between storage piles and the walls or columns of the building. Large amounts of water were poured on the burning paper causing it to expand and shove out the walls. They collapsed on adjoining buildings and on fire fighting equipment in the street.

Check Your Trucks

Mobile equipment has greatly increased the efficiency of warehouse operations but has introduced additional hazards. A warehouse for storage of canned goods in California was destroyed in a fire which is believed to have originated in a lift truck. The fuel tank was being filled inside the building from a five-gallon can. An explosion occurred which killed the operator and two other employees. A warehouse in Oregon was destroyed when an electric lift truck backed into a storage pile. The resulting short circuit ignited combustible wrappings on the stored materials.

With gasoline driven equipment, fuel tanks should be protected from external damage and corrosion, drains should be provided to insure that spillage and leakage will go to the floor instead of on the engines, a shut-off valve should be provided for the fuel line and a backfire deflector should be installed on the carburetor.

Electrically-powered trucks should be designed so that there is no exposure of live parts on the truck surface and that operating parts are readily accessible. Suitable overcurrent devices should be installed and batteries should be protected from damage by collision and provided with trays to catch acid seepage.

Dangerous Materials

In addition to storage facilities most warehouses offer other services which may contain fire or explosion hazards. A Delaware warehouse suffered extensive fire damage from an overheated glue pot used in minor repair of furniture. A fire occurred in this location two years before when fuel was spilled from an alcohol torch. Many wholesale food warehouses have processes for artificially ripening fruits and vegetables through the use of heat and the flammable gas, ethylene. Lack of sufficient precautions in the use of this gas resulted in an explosion which killed two men and heavily damaged an Indiana warehouse.

The usual activities of housekeeping and maintenance have caused warehouse fires and warrant consideration. The manager of a Louisiana warehouse made arrangements for the disposal of rubbish by having an empty boxcar spotted on a siding adjacent to the building. After the car was filled it was to be removed. However, the trash caught fire one night and flames entered the warehouse through unprotected windows.

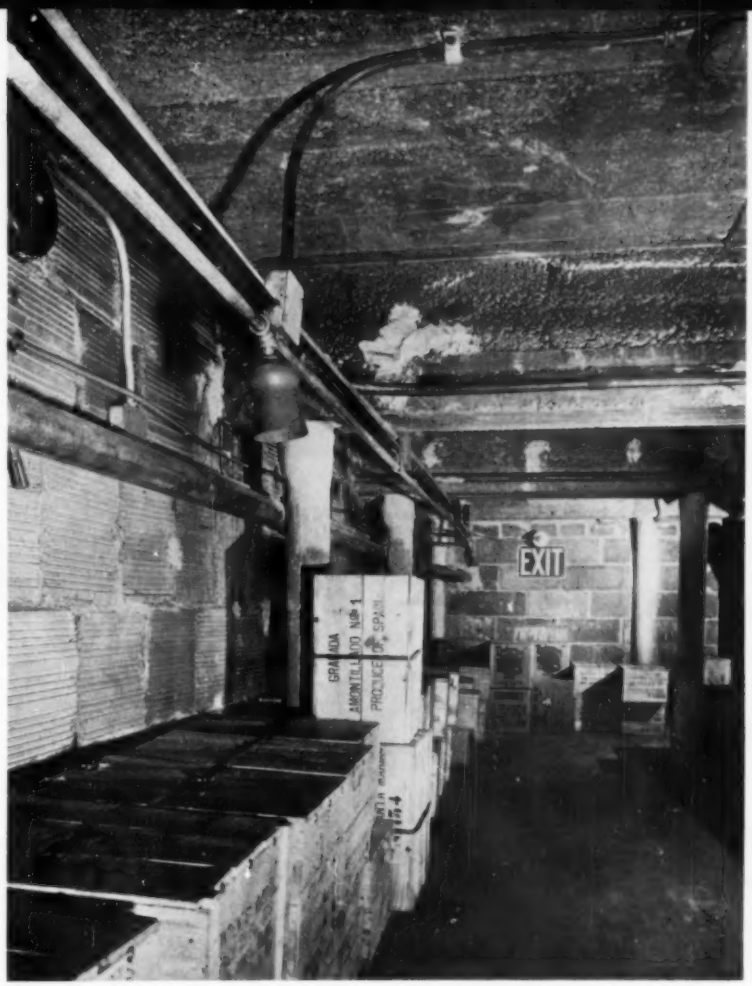
Two workmen in a New York sugar warehouse were welding broken rings on steel window frames. They held the windows in an open position so that the work could be done outside but a shower

(Continued on page 58)

THE seemingly insignificant question of fire protection for two basement storage areas in a large office building in New York City, recently posed a unique problem. The areas in question, directly above part of the New York Central tracks running into Grand Central Terminal, are used for hat inventory and liquor storage by two stores in the building.

Installation of water sprinklers was a possible solution to the problem. However, water would cause severe damage to stored hats and possible damage to liquor valued at thousands of dollars. Even more important was the possibility that water might seep down from the rooms onto the tracks. There, where exposed third rails carry 660-volt, direct current, water could disrupt the use of as many as 20 tracks. Such a condition would seriously affect the movement of more than 600 trains which daily enter and leave the terminal—particularly during rush hours when 3 trains pass the station's Mott Haven signal tower every 2 minutes!

Extinguisher manufacturer's representative points to store's manual release pull box for inventory storeroom's carbon dioxide fire extinguishing system, normally automatic.



Partial view of inventory space. Rate-of-rise fire detector is mounted on ceiling (top right) and two CO_2 discharge nozzles on pipe at left. Bell (top left) rings if extinguishing system is actuated, to warn personnel to leave within 45 seconds.

They didn't dare wet it; so they decided to

Smother It!

CO_2 System Answers Problem

An extinguishing equipment manufacturer was called in and engineered and installed a carbon dioxide fire extinguishing system for the two areas. Automatic in operation, the system offers prompt extinguishing protection without the

Maintenance supervisor of building checks manual releases for CO_2 cylinders (right, foreground), which are normally automatic.

Come to BOOTHS 116 - 117, see and operate this equipment

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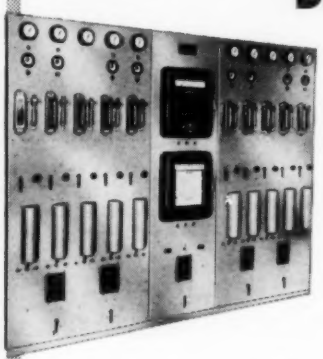

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danger or damage presented by water.

The heart of the system comprises a bank of fourteen 75-pound cylinders of carbon dioxide. A piping network connects them with both hazard spaces which have a combined area of 10,985 cubic feet. If a fire occurs, temperature-rate-of-rise detectors mounted on the ceiling of the "in trouble" room cause a directional valve to turn and trip the cylinders. The released carbon dioxide, under its own pressure, surges from the cylinders, through the directional valve, and passes via piping to the appropriate storage space. There it is discharged from nozzles as an inert gas in sufficient quantity to reduce oxygen in the space to a point insufficient to support combustion. The fire is virtually smothered.

Passage of the gas through the piping throws pressure operated switches which trigger electrical alarms both in the building engineer's office and in the store concerned. In addition, a special 45 second time delay, complete with warning howler, was built into the system so that anyone in the room at the time of cylinder release would have ample time to vacate the space before the discharge of gas.

The system, which normally stands automatic fire watch, can be actuated manually by means of pull boxes at the cylinders or from either store. A feature of carbon dioxide which both stores find particularly appealing is that the inert gas cannot damage inventory, and is eventually absorbed into the atmosphere following discharge leaving no mess to be cleaned up.

Pictures by courtesy of Walter Kidde & Company.

Warehouse Fires

(Continued from page 56)

of sparks ignited burlap bags containing sugar and caused heavy damage from fire and water.

Further information concerning the fire protection of warehouses is contained in Technical Survey No. 1 "Fire Safeguarding Warehouses," an illustrated publication of the National Board of Fire Underwriters.

Industrial Hygiene

Associate Editor
Jacob A. Goldberg, A.M., Ph.D.

Industrial Health Conference

SPECIALISTS in different phases of industrial hygiene will speak before the meeting of the American Industrial Hygiene Association, April 26 to 29, as a part of the Industrial Health Conference in Chicago.

On Wednesday and Thursday, concurrent sessions will touch on over 50 different aspects of air pollution, chemistry and analysis, engineering, radiation and toxicology. Experts in these fields will share their knowledge with the hygienists. At general sessions, topics range from "Evaluating Industrial Skin Exposure," to the problem of noise hazards. Other meetings will include discussions on industrial hygiene instruments, solvent vapors, dusts, gases and metal fumes, and the responsibility of the professions in health education of the employee.

ASA Reports on Relationship Between Hearing Loss and Industrial Noise

SCIENTISTS have for the first time produced data for relating average hearing loss to noise exposure in industrial environments. The 60-page report, "The Relations of Hearing Loss to Noise Exposure," has been released by the American Standards Association.

The data are results of a year and a half of study by Exploratory Committee Z24-X-2 of the ASA Sectional Committee on Acoustics, Vibration and Mechanical Shock. Walter A. Rosenblith, Professor in the Department of Electrical Engineering, Massachusetts Institute of Technology heads the committee. Dr. Rosenblith states that management can now estimate the probable hearing loss of a group of individuals exposed to noise of a specific type for a given period.

He added that information is still meager on such important subjects as individual variation around average loss; the effectiveness of ear protection in industry; the effects of noise on the hearing of women; and the effects of exposure to noise upon persons with initial high frequency hearing loss.

Members of the committee stressed the study is directed toward the eventual development of standards and criteria for noise control, and that this study will constitute the basis for the development of future standards. Interested readers may obtain copies of the report from the American Standards Association, 70 East 45 Street, New York 17, N.Y., at $1.50 per copy.

Air Pollution Conference

THE 47th Annual Meeting of the Air Pollution Control Association will be held at the Patten Hotel, Chattanooga, Tennessee, on May 3, 4, 5, and 6. whose headquarters are in Mellon Institute, Pittsburgh. Some 600 management executives and other representatives of the industries, research scientists, and air pollution control officials will attend the four-day meeting.

35 technical papers will be presented covering the subjects of coal, incineration, petroleum, municipal problems, dusts and fumes, steel, odors, measurements, and meteorology.

The last day of the meeting will be set aside for plant inspection trips to study air pollution and control devices. For details, contact Harry C. Ballman, executive secretary, Air Pollution Control Association, 4400 5th Ave., Pittsburgh 13, Pa.

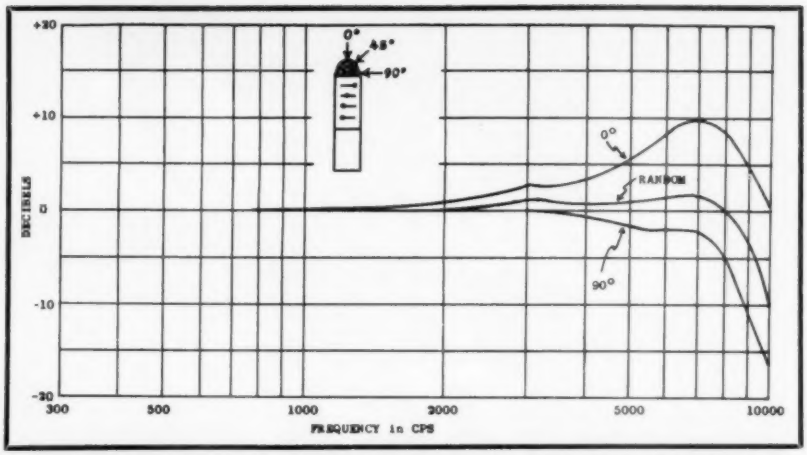

Fig. 2. Graph illustrates averaged responses of sound level meter crystal microphones to sounds arriving at differing angles of incidence. By properly orienting the microphone, increased sensitivity to high-frequencies arriving from the 0 degree angle, a characteristic common to microphones of all types, will be overcome.

By VICTOR H. POMPER
Assistant General Manager
Hermon Hosmer Scott, Inc.
Cambridge, Massachusetts

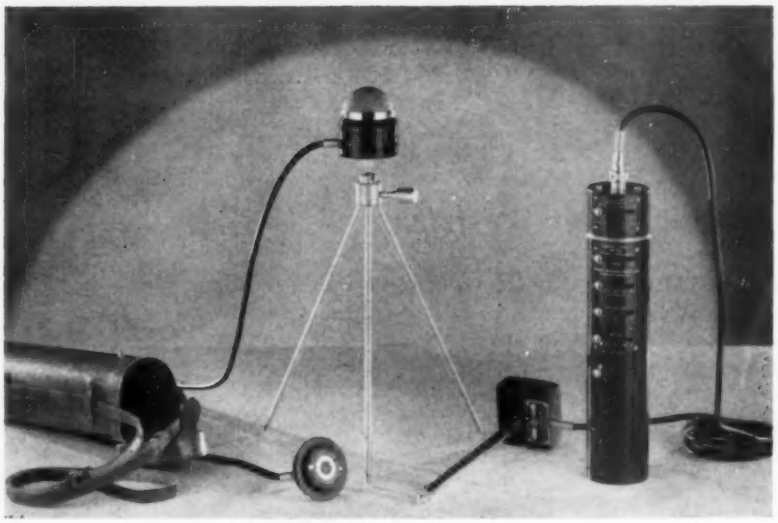

Fig. 3. Illustration contains sound level meter accessories, including tripod, extension cable with input adaptor and carrying case. A vibration pick-up is shown connected to the vibration integrator, which is attached to the sound level meter in place of the normally used microphone.

FEATURE

Third article of a series on Industrial Noise Control. First two articles appeared in the February and March issues.

NOISE EVALUATION

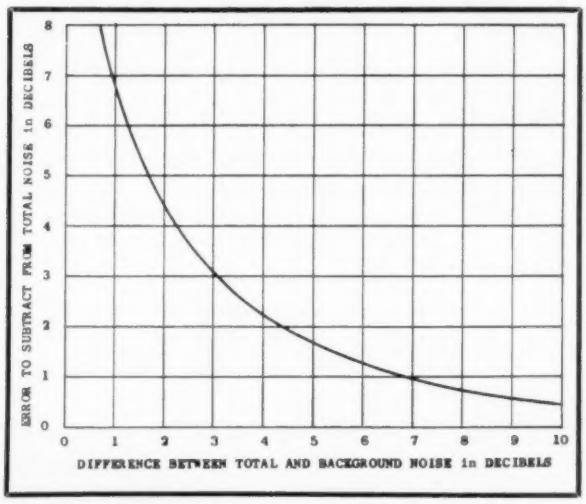

Fig. 1. Graph shows corrections to be applied to total noise in order to subtract effects of background noise and obtain valid readings from the noise source being studied.

ALTHOUGH noise-induced hearing loss is currently receiving wide attention, unchecked industrial noise has other adverse effects. Such noise may mask normal speech communication and interfere with production or increase accident susceptibility because workers cannot hear instructions or warnings. Also under certain circumstances noise may have a high annoyance value, which causes wear and tear on nerves. Such sustained nervous stress frequently results in "fight or flight" reactions on the part of employees. Industrial strife and high labor turnover are the extreme results, but even moderately annoying noises can lower production or increase spoilage and accident susceptibility by introducing tension-producing disturbances which interfere with concentration.

Aside from its physiological and psychological effects, noise often is an indication of defective machine maintenance. The vibrations causing audible noise may be a

Fig. 4. Noise analysis worker measures sound reaching workman's ear. However, as text points out, sound field distortion effects would be caused by placing the microphone so near an individual during actual noise measurement.

AND CONTROL

sign of misadjustment or malfunction—decreasing machine life.

Most authorities agree that the basic step in evaluating noise hazards is to make careful measurements and analyses with instruments meeting recognized standards. An electrical engineer does not make valid repeatable measurements of electrical voltage and frequency by putting moistened fingers into a "live" socket, nor can a safety engineer expect valid noise measurements by ear alone and without reliable instruments.

Though the noise problem is very complex, measuring and analyzing instruments allow it to be separated into simpler components more amenable to correction. Just as in solving most problems, the specific, not the generalized approach is most productive. Noise studies provide important clues to noise sources and methods of controlling them; they also provide factual records of noise hazards and effectiveness of abatement efforts.

Who shall make the noise studies in industry? Under some circumstances, generally those involving simpler or limited noise problems, outside help is advisable from either an insurance company or consultants. Larger plants, with many machines and changing layouts, processes or equipment, often find it advisable to have instruments and to train company personnel in their use. Often minor changes in machines or layouts will have substantial effects on noise generated, so trained company personnel with suitable instruments are particularly important where plant conditions do not remain static.

Noise Behavior

To evaluate and control noise effectively, a basic understanding of noise behavior is important. Noise, like heat, is transmitted energy. Though the analogy is not

exact, comparing noise with heat can help give a better understanding of the noise problem. Noise, like heat, may be radiated directly through the air from source to receiving surface, or it may be transmitted or conducted through solid material. Just as heat is more readily absorbed by dark colored bodies and reflected by shiny, bright surfaces, noise is more readily absorbed by porous, perforated objects and reflected from hard, smooth surfaces.

Noise control in many respects is analogous to heat control. As insulation prevents heat transmission, so vibration isolation can prevent transmission of noise. When adequate provision for heat dissipation (cooling) is absent, heat in enclosed areas builds up to high levels. Noise similarly can build to high, dangerous levels unless proper dissipation (acoustical absorption) is provided. Enclosures can be provided to contain noise or heat within impenetrable barriers. Attempts can be made to decrease generation of noise or heat at their sources, or to use alternative processes generating less heat or noise. Another approach is dissipating the heat energy by cooling, or dissipating the noise energy by acoustical absorption. As a last resort, individual protection can be furnished from heat by heat resistant clothing such as gloves or asbestos suits, and from noise by ear defenders, plugs or muffs.

Danger from heat, such as fire hazards, may be vivid and spectacular. Most managements invest substantial amounts for protective equipment, including sprinkler systems, portable fire fighting equipment, and often trained plant fire brigades. The noise hazard is far less dramatic. Since its adverse effects normally take place over long periods of time, and usually without spectacular effects, noise is perhaps one of the more insidious hazards facing industry.

Noise may be considered as continuous narrow-band or wide-band sound, or intermittent sound, including single or repeated impacts, air exhausts from pneumatic equipment, and so on. Aside from the character of the noise, its frequency is important. Noise frequency analysis gives substantial clues as to the most effective means of controlling and reducing the noise. Higher frequencies, that is above about 1000 cycles, generally are both most annoying and also most hazardous to human hearing. Higher frequencies with their shorter wave-lengths are radiated directionally. The energy contained in sound and noise decreases rapidly as the frequency increases. Consequently higher frequency noise is less readily transmitted through solid objects, and its effects generally are felt as direct radiation, or reflection of direct radiation. Because of its directional properties and because most acoustical materials absorb high frequencies better than low frequencies, higher frequency noise is more readily controlled by interposing barriers between its source and areas to be protected.

Low frequency noise has relatively high energy and long wave lengths and is not at all directional. Generally, large surfaces are required to radiate low frequen-

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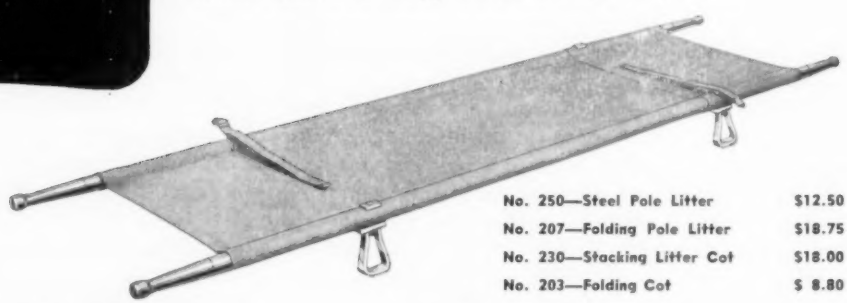

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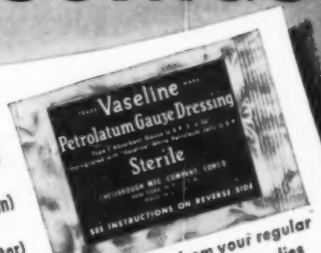

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cies, whereas high frequencies can be generated by small sources. Low noise frequencies are very readily transmitted over long distances through solid material, often to large surfaces capable of radiating them noisily. Low frequency noise is best controlled by providing a discontinuity in the path of its transmission through solid material, often by means of vibration insulation in the form of shock mounts or cushioning material of comparatively high compliance or flexibility.

An important effect amplifying noise signals is the resonance of hollow objects, much as a guitar "sound box" resonates to amplify weak signals from the strings. In noise control, resonance effects can be controlled somewhat by adjusting the resonant part so its natural frequency of vibration is changed. This can be done by changing operating speeds or the part's mass, by stiffening or clamping parts or by changing the exciting force. Another effective means of controlling the noise is damping. For example, asphalt treating of auto panels deadens resonant noise by introducing damping, which lessens resonant vibration amplitude.

Reverberation

When a noise source radiates energy into an enclosure whose surfaces are reflective, individual sound waves ricochet randomly for considerable times before their energy is dissipated. This effect is known as reverberation and plays an important part in building up high noise levels, particularly if numerous noise sources contribute to the overall din. In such cases, both direct radiated noise and indirect reflected reverberations must be considered. Since noise power in free space is inversely proportional to distance, each time distance from a sound source doubles the noise power is halved. This gives a decrease of 6 db in the sound pressure reading of a sound level meter. Reverberant noise levels, however, generally remain fairly constant. In the vicinity of a noise source this fact allows boundaries to be determined between the reverberant sound field and the direct sound field surrounding the noise source. This direct radiation sound field is also known as the inverse-distance or free space field. Sometimes, though, when noise sources generate relatively pure continuous sounds, standing waves may exist—that is, the reflections build up steady-state paths throughout the enclosure in such a fashion that in some areas sound energies following different paths either cancel or reenforce, causing widely different sound readings between very closely adjacent areas.

Is it possible to find any order in such an appalling cacophony of noise? Remember that with proper measuring and analyzing equipment the various individual noise components can be unscrambled to a considerable extent, so that major offenders can be tracked down separately for corrective action. The analogy of noise to heat or fire in this respect is particularly important. No one method or combination of methods is a cure-all in heat control. Each situation differs, but the methods of attack are similar—that is dissipation, insula-

tion, isolation, source control, and individual protection. In practice, too many safety engineers approach the noise problem with dread and hesitation, though they would take vigorous corrective action against a heat or fire hazard.

Noise Measurement Techniques

In unscrambling complex noise problems into components more amenable to correction, normal instrument operating instructions should be followed. These differ somewhat depending on the type of equipment and its manufacturer. Since such instructions usually are sufficiently explicit for all practical purposes, it is unnecessary to repeat them here. There are a number of "tricks of the trade," however, which will aid in obtaining valid effective noise studies. If they are ignored, incorrect or misleading readings may result. First, when making noise studies it must be remembered that the unit of measurement, the decibel or db, is a logarithmic unit * and cannot be added arithmetically. For example, two identical noise sources each producing 60 db of sound will add to produce a total level of 63 db of noise, not 120 db. A good rule to remember is that a 3 db change in noise represents either a doubling or a halving of the sound power. In order to add noises of unequal value, a table of logarithms, a slide-rule or a decibel table is necessary.

In adding noises, if one noise is 10 db or more above another, the lesser noise is negligible for all practical purposes, since its contribution to the overall intensity is very slight. Logarithmic addition and subtraction of noise levels is most often required in correcting readings for effects of background noise, if such background noise is 10 db or less below the noise being measured. Existence of such a condition may be detected by turning off the noise source and measuring the background level. Fig. 1 shows a chart giving corrections which must be applied to the total noise in order to subtract the effect of background noise and so obtain accurate readings of the noise source being studied. Obviously this noise must be louder than the background noise if this procedure is to be possible. The greater the difference between a noise source and background noise, the more accurately the source noise level can be determined.

Microphone Placement

In making valid measuremeents, proper placement of the sound level meter microphone is particularly important. Noise levels in a room or surrounding a noise source vary; and, as a rule, a number of measurements must be taken and averaged to get an accurate result. Ideally, this average could be obtained by taking the

* The decibel is 10 times the logarithm to the base 10 of the square of the ratio of two sound pressures. That is, db equals 10 log $(P_1/P_0)^2$, or db equals 20 log P_1/P_0 where P_1 is the sound pressure measured and P_0 is a reference level, customarily 0.0002 dynes per square centimeter, the A.S.A. reference level.

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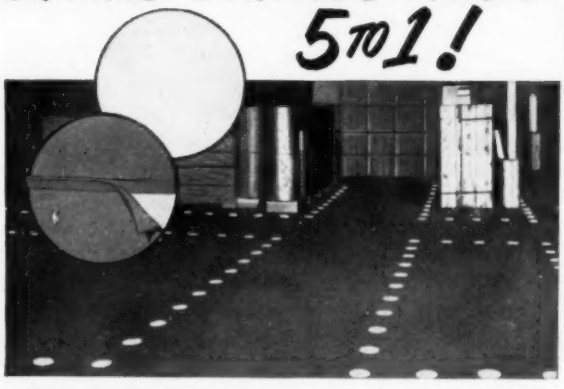

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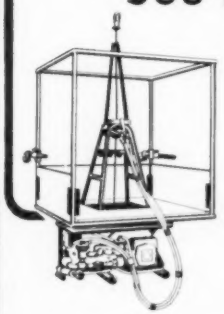

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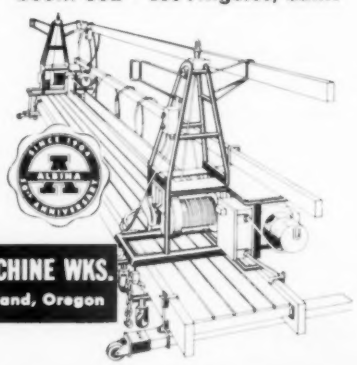

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antilog of each reading, adding these, obtaining an average, and then converting back to decibels for the average reading in db. In practice, a simple arithmetic average is usually satisfactory, particularly when the various readings are within a range of approximately 10 db.

If the noisy machine is large, or if the radiated noise field is non-uniform, the measurements must be made with considerable care and many measurements must be made to obtain an accurate average noise value. Sometimes the highest readings, such as from highly directional noise, will be more significant than an overall average. The effects of background noise must always be considered and compensated for.

In placing the microphone, keep in mind the purpose of the measurements. If the purpose is analysis of machine noise for clues toward possible reduction, the noise measurements should be made in the free-space or inverse-distance field surrounding the machine, which contains primarily direct radiation such that the meter reading decreases by 6 db for each doubling of distance from the source. If measurements are being made to determine noise effects on workers not near the machine, the measurements will be made in the somewhat more distant reverberant field, since measurements should always be made in that area of greatest interest, which in this case is the employees' normal working area. When measurements are being made in the free-space or direct radiation field rather than in the reverberant field, it is important that the microphone be at least 2 or 3 feet from any obstacles in the path of the sound waves. If this precaution is ignored, reflection effects may distort the sound field near such objects by as much as 5 db or more.

The miniature sound level meter shown in Fig. 4 is excellent for such purposes since the cylindrical construction of the sound level meter causes no reflections from plane surfaces of an instrument body behind the microphone. This often makes an extension cable unnecessary for accurate readings. The sound level meter position in this photograph is not ideal, however. The meter is being held near an individual's head which acts as a barrier distorting the sound field. More valid measurements would be obtained at a distance of several feet from the test subject, but at the same height and separation from the noise source. This is important because most noise level studies determining hearing damage and communication masking are based on measurements in an unobstructed sound field.

Measurement Accessories

A variety of measurement accessories are available as shown in Fig. 3. These include tripods for fixed sound level meter location or for mounting remote microphones connected by extension cables to the instru-

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ment. If an extension cable is used, a correction factor must be applied depending on the average temperature during measurement. A correction curve normally is furnished with the various manufacturers' standard extension cables.

The vibration pickup and integrator shown in Fig. 3 are useful both for making mechanical measurements on vibrating machine surfaces and for making vibration measurements on surfaces whose noise output is beneath the ambient room noise. Here the mechanical vibration is read as a measure of the noise level which, after all, is proportional to the vibration causing it. The meter readings in decibels can be readily converted to rms values of acceleration, velocity or displacement by use of conversion charts provided.

Microphone Directional Effects

In making measurements, not only is microphone placement important but proper orientation of the microphone is essential. Though all leading sound level meters use so-called non-direction microphones, these microphones usually have increased sensitivity to high frequencies at the 0 degree, angle of incidence, as shown in Fig. 2. Usually sound waves striking a non-directional microphone arrive through various random paths, consequently striking the microphone at random incidence. When sounds are being measured which contain appreciable high frequency components, however, the sound level meter should be held so that the sound strikes the microphone at an angle at or near the 60 degree angle, where response approximates the random response, and certainly at no less an angle of incidence than 45 degrees.

Under some circumstances, directional microphone effects are an advantage in localizing sources of noise. Under such circumstances an actual or improvised megaphone, placed about the microphone, will give a directional effect. In localizing sound sources, a pair of headphones can be very helpful. The headphones are connected directly to the sound level meter output-jack and give audible indications of direction.

Extraneous Factors Effecting Readings

Headphones are helpful also in determining whether or not wind noise exists. Wind may introduce errors in noise measurements by producing vortices or whirlpools of air caused by the microphone's non-uniform surface. These whirlpools create alterations in atmospheric pressure and can thereby cause spurious noise signals to be read. Such wind noise can be fairly readily heard in earphones, both when relatively large fluctuations occur from gusts and as a higher pitched whistling or hissing. If wind noise exists, either a less exposed position should be found for measurements, or some sort of wind screen should be used to reduce the effects of vortices at the microphone.

Other spurious signals interfering with noise measure-

ment are microphonics, which are false signals generated by the vacuum tubes as a result of actual physical vibration of the instrument. Such microphonics can be caused either by direct transmission of vibration through the solids upon which the sound meter rests, or by impinging of extremely intense airborne sound vibration upon the instrument. Microphonics can be detected by removing the microphone (shield the open input with a metal plate) to see if spurious signals are read with microphone disconnected. If so, hold the sound level meter in the hand or place it upon suitable sponge rubber cushioning. Modern instruments normally are not affected by airborne transmission of high intensity sound vibration, and microphonics from this source will not generally be noted unless a vacuum tube is unduly sensitive.

In areas where very strong electro-magnetic or electrostatic fields exist, it is possible that these fields may cause stray pickup. Such effects can be detected by comparing the noise actually heard with that heard through earphones connected to the sound instruments. Modern instruments are carefully shielded against such fields, although some dynamic microphones are quite sensitive to strong magnetic fields.

Machine Noise

The normal Rochelle salt crystal microphone furnished with standard sound level meters has high sensitivity and stability, wide, comparatively smooth frequency response, and considerable ruggedness. It is important, though, that the microphone be protected from temperatures higher than 115 or 120 degrees F. or the microphone may be damaged or destroyed. For example, it is most unwise to leave a sound level meter in a closed car or car trunk on a hot summer day unless it is carefully wrapped in a blanket or coat as protective insulation. For storage or use in high temperatures, a moving coil microphone with matching transformer is recommended. The Rochelle salt crystal microphone also can be affected by extremes of humidity, which may damage the crystal. In hot moist climates, the moving coil microphone is a better choice if humidity and/or temperature is excessive.

In separating complex noise fields into simpler components and tracking the loudest offenders to their source for corrective action, the new half-octave filters are particularly helpful. These have available additional cutoffs below 75 cycles where many machinery noise fundamentals lie and also above 4800 cycles where annoying high frequency components may exist. Often it is desirable to determine whether the frequencies having highest noise levels occur at natural resonances in machinery or with harmonics of rotational speed. Such resonances and rotational speed are fairly easily calculated or measured. Since harmonics differ by a factor of 2, knowing the frequency closer than by a factor of 2 determines which harmonic is at fault. The new half-octave analyzers are entirely adequate for such analysis

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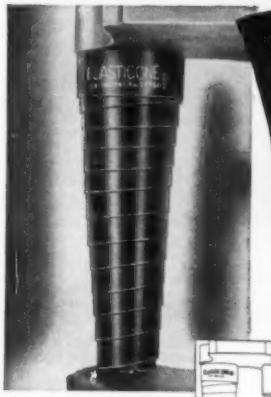

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and are considerably quicker and more convenient to use than other instruments tuneable directly to the harmonic or rotational frequency.

One last word on "tricks of the trade": sound and noise pressures normally fluctuate somewhat while taking measurements. In taking a single measurement, for example, a sound pressure may vary randomly between, say, 73 and 79 db. In such a case the mean, or 76 db, value would be most nearly correct.

Controlling Noise

Now to apply an understanding of noise, noise measuring and analyzing instruments, and measurement techniques to actual control of noise hazards. It is very similar to the more familiar solutions to heat control: insulation, isolation, elimination and protection. In making a noise survey, it is advisable to first take a number of readings throughout the area to be studied. The areas of loudest and/or most annoying noise should receive attention first. Using the diagnostic noise instruments described previously, attempt to localize sources of loudest noise and analyze these for clues as to their causes and cures. Typical sheets for recording data are shown in Fig. 5. Here, both overall sound levels and octave band levels are taken. For greater precision of analysis, half-octave bands should be recorded, or if less accuracy is adequate, wider band widths may be used.

In general, if noise cannot be reduced or eliminated at its source, it must be either isolated, insulated or absorbed, or individual protection against its effects must be provided. Under some circumstances noise can be reduced by dispersion of various noise sources to reduce high noise concentration in given areas. Instead of concentrating noisy machinery in a given locality where ambient noise levels can build up to dangerous levels, it is advisable to scatter such machinery somewhat if production processes permit. This spreads the somewhat reduced noise over a larger area.

Reducing Noise at Its Source

Reducing noise at the source is always worth the attempt, although unfortunately more often than not major results cannot be obtained. Perhaps replacement of defective bearings or gears will reduce noise, or sometimes bolting down loose covers or providing fiber covers in place of resonant sheet metal will have effective results. Proper lubrication and overall maintenance might be partially effective. Sometimes, but not often, it is possible to replace the machine or process by a quieter one. For example, welding in place of riveting, grinding in place of chipping. Sometimes the process can be modified somewhat—for example, in a punch press the die face may be slanted so that one edge enters the work first with a quieter shearing action, rather than with a single loud impact of all die surfaces on the work. Bracing machine members or clamping the work

SOUND SURVEY

COMPANY _____
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INSTRUMENTS USED
SOUND LEVEL METER - TYPE _____ MODEL # _____
MICROPHONE _____ CABLE (Length) _____
ANALYZER - TYPE _____ MODEL # _____
OTHERS _____

NOTE: If noise is directional record - Distance of the source, microphone position, incidence on microphone (Normal, Grazing, Random).

INDUSTRY _____ TYPE OF MACHINE _____
MACHINE MODEL # _____ NUMBER OF MACHINES _____
LOCATION OF MACHINE IN ROOM _____

ENVIRONMENT (Type of building, walls, ceiling, etc.; other operations, any attempts at sound control)

PERSONNEL EXPOSED - DIRECTLY _____ INDIRECTLY _____
EXPOSURE TIME PATTERN _____
ARE EAR PLUGS WORN _____ TYPE _____
ARE THERE AUDIOMETRIC EXAMINATIONS _____
PREPLACEMENT _____ PERIODIC _____

Note information as to who makes these examinations, conditions under which they are made, time of day they are made, where records are kept.

Engineer _____

Fig. 5. Forms used to record background data and actual sound level measurements and frequency-band analyses.

SOUND LEVEL VALUES

(NOTE: Record A, B and C Networks on the Sound Level Meter)

		FREQUENCY RANGES (Cycles per Second)								
Location	Flat 0	20-75	75-150	150-300	300-600	600-1200	1200-2400	2400-4800	4800-10,000	Flat 0

sometimes may help, as may replacing noisy metal gears with fiber or plastic ones.

Vibration isolation, such as shock-mounts or pliant cushioning material, provides a barrier in the solid paths transmitting vibration and can reduce noise somewhat. However, it is primarily the lower frequencies which are transmitted in such a fashion. This method of isolation is most productive where relatively low frequencies are transmitted over comparatively large distances through buildings. In general the more damaging and more annoying higher frequencies are radiated directly from the noise source, and constitute the major hazard.

Acoustical treatment of walls and ceilings has proved quite effective in absorption of reflected noise, thereby controlling reverberation in the room enclosure. Normally, though, substantial noise is radiated directly, so acoustical treatment is of little help to employees within a free-space field of direct radiation from their machine or machines. Various acoustical materials have different coefficients of absorption, and frequency analysis of the noise may aid in selecting the most effective material for acoustical treatments. In general, acoustically absorbing material on room enclosure surfaces provides up to about 10 db of quieting because direct radiation is not reduced. Remember, though, that a 10 db decrease in noise means a noise power reduction of 90 percent, a major accomplishment. Even 3 db, which represents a 50 percent decrease in noise power is a worthwhile attainment.

Enclosure of Noise Source

Partial or complete isolation of a noise source is often the most effective means of noise control, however. In some cases this is accomplished by impervious barriers such as walls. In such cases it is essential that these barriers be sufficiently massive to prevent flexural bending or vibration as a result of impinging noise energy. Such vibration would merely cause re-radiation of noise on the side of the barrier opposite the impinging noise, with little consequent quieting. Massive barriers can be effective means of isolating noise, but if employees are expected to work within the area enclosed, it is essential that adequate absorption (dissipation of noise energy into infinitesimal heat energy) be provided to keep noise levels in the enclosure within reasonable limits. If this is not done, noise levels may readily build to intolerable levels, much as heat would build up in an enclosed space lacking adequate cooling or ventilation.

Another means of isolation is complete enclosure of a machine only, so that no appreciable noise can leak out. Since sound may leak from small openings much as water will do, a fairly tight seal is important. Isolating covers and enclosures, or partial barriers such as hoods or movable panels, should be constructed from combinations of impervious barriers such as heavy sheet metal, and sound absorbing material which dissipates acoustical energy into other harmless forms of energy.

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Combinations of these various quieting methods are always possible. An extensive noise control program, for example, might involve vibration isolation in the form of shock mounting of machines, complete enclosure for comparatively small, noisy automatic equipment, heavy walls and doors separating particularly noisy areas from quiet areas, partial barriers such as movable wall panels or acoustical panels suspended from ceilings to break up direct radiation, acoustical treatment of walls and ceilings, and dispersion of noisy machinery to reduce noise concentration in a given locality.

Individual Protection

The fact remains, though, that in many cases very little can be done to minimize noise in some locations, such as heavy forging operations, for example. In such cases, ear plugs, ear defenders or ear muffs may be needed for employee protection if their use can be enforced. Unfortunately, enforcing use of such protective devices is far easier said than done because of employee resistance. In such cases, vigorous educational efforts on management's part are essential, together with normal supervisory discipline to enforce protection.

The noise problem is indeed complex. Yet, by separating an overall noise problem into its individual components——noise measurement and analyses——the noise hazard can be attacked step by step and con-

Noise Control *(concluded)*

trolled. Noise is not a spectacular but an insidious danger, and substantial study and corrective action must be expended before the hazard can be controlled effectively. Such control can pay appreciable dividends in terms of greater employee morale and motivation, reduced nervous tension, reduced accident susceptibility and greater ability to hear instructions or warnings, increased machine life, and last, but not least, decreased legal liability for noise-induced hearing loss. The dividends accruing to alert and progressive management from effective noise control are considerable. The responsibility for taking vigorous action to protect his plant from noise belongs to the safety engineer.

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R.N., A.M., Ph.D.

A New Perspective

IN 1952 a report by the Task Force on the Handicapped of the Office of Defense Mobilization, pointed out that: "When physical standards were drawn up during the first and second decades of this century, they were influenced by the "anatomical" concept of medicine then in sway. Competence was measured in terms of anatomical perfection. A man was either fit or unfit for work depending on whether or not he was anatomically whole. It was all or none. A man could do the whole job or none of it. He was disabled for all work if he was disabled for any part of it."

New Concepts Too

With the development of the physiological or functional concept of medicine and the specialization and sub-division of jobs into their components, the report continues, the "perfect anatomical specimen" concept is no longer valid in determining suitability for employment. With this changeover in medical thinking, came a broader approach to concepts concerned with the employment of the handicapped. In times of surplus labor supply, employment departments are apt to be somewhat strict in the standards they set for all applicants. When the situation changes, and, as has previously been pointed out in these columns, our working population is getting older on the average, adjustment must be made if industry's machines are to be fully tended.

But there is a further responsibility to society as a whole. There is no "normal" worker. All of us have defects in varying degrees. A sensible middle ground must be accepted and the changed concept adopted by the armed forces emphasizes this. We cannot leave people on the human scrap heap because of a physical handicap. With competent medical departments manned by skilled physicians and experienced nurses, greater chances can be taken in hiring those with physical shortcomings. How far to go and what to do in industrial cases is always a matter for serious consideration by management and industrial health workers.

How Hard Can Man Work?

THIS is a subject which has received much laboratory study, and considerable thought in many countries. It is considered from a physiological point of view in *The Lancet*, a leading British medical journal, in an editorial in the January 23rd issue.

A well known German investigator is reported to have shown that various laboratory findings dealing with the subject can be applied to the distribution of rest pauses in industry. Everyday tasks, such as carrying heavy loads or shovelling can be kept below the fatigue level with suitably spaced pauses. In all types of physical work new apparatus has made it possible to measure under industrial conditions oxygen intake and to equate the results of individuals against standards. Working capacities can also be accurately defined.

The team of physiologists has laid down rough limits of working capacity up to which a "man in overalls" might be expected to be efficient. No effort has been made to define similar limitations for "white collar" workers. Efficiency, rate of production, labor turnover, accident rates, labor relations—these are some of the major factors involved in the hours of work and working capacity.

There is of course a distinct and normal variation both in capacity and speed of accomplishment. Both the physical and nervous systems of some are highly geared to rapid yet accurate work over an extended period of time. These workers are in a way pacemakers for others. However, some basis must be developed for average high-production for all workers at the same tasks receiving equal or comparable pay. Labor contracts may define the minimum production for the maximum pay provided for. This is likely to be fair both to employers and workers. What the industrial nurse may be able to do is to be on the alert for those men and women who show evident signs of exhaustion —whether due to acute or chronic illness, overwork at home, family or other worries, and a large list of other possible causes.

School of Alcoholic Studies

THE twelfth annual session of the Yale University Summer School of Alcohol Studies will be held this year from July 5 to July 29. Announcement of the dates and program for this year's Summer School was made by its Director, Selden D. Bacon, Professor of Sociology and Director of the Yale Center of Alcohol Studies.

At the same time he announced that at the conclusion of the Summer School session, an Institute on Alcoholism for registered professional nurses will be held for the first time from July 29 to July 31.

The Summer School is designed to offer a systematic investigation of various aspects of the problems of alcohol by reviewing current literature on the subject and analysing the most recent findings of scientific research.

The School's curriculum this year will be organized around 10 major topical areas. These are: the origin, structure and nature of social problems; theories in the development of personality; society and the problems of alcohol; drinking as a folkway; the chemistry and physiological action of alcohol; the psychological effects of alcohol; theories concerning the nature of alcoholism; theories on the treatment of alcoholism; specific contemporary problems arising from alcoholism; and current activities and trends in the study of this area.

In the Nurses Institute, attention will be directed toward the effectiveness of various treatment resources, Mr. Bacon explained.

"Particular emphasis will be given to the role of the nurse in interpreting to patients or to their families the nature of alcoholism and the necessity of securing specialized assistance following hospital treatment for acute intoxication," he said.

The Institute is sponsored by the Yale University School of Nursing, the Summer School of Alcohol Studies and the Connecticut League for Nursing. Inquiries about the Summer School and the Nurses Institute should be addressed to Mr. Bacon at the Yale Center of Alcohol Studies, 52 Hillhouse Avenue, Yale Station, New Haven, Conn.

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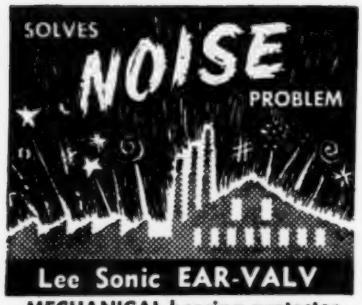

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SAFETY ACHIEVEMENTS

THE Piqua Tubing Division of Armco Steel Corporation has been honored as the safest plant in the entire Armco organization. The division operated throughout 1953 without a single accident, and for the second straight year received the corporation's "Iron Man" as its award. Competitive groups from more than 60 of the corporation's units took part, and rivalry was keen. The award will remain at the Piqua plant throughout 1954, or as long as that division maintains the corporation's best safety record. The plant has not had an accident since May 29, 1951—a total of 973 days.

THE Blaw-Knox Company's Chemical Plants Division has won first place in the National Accident Prevention Contest of the Associated General Contractors of America for 1953. This award recognizes the best safety record in Group A, which includes contractors doing the largest volume of work, or more than 500,000 man-hours annually.

During 1953 Chemical Plants Division did more than 15 million man-hours of construction work. This work was done for the chemical, petroleum, petrochemical, and other process industries, as well as for the Government, particularly the Atomic Energy Commission.

THE National Safety Council Award of Honor has been presented to the U. S. Atomic Energy Commission in recognition of the safety record achieved in the atomic energy program during 1952. The award was presented by Ned H. Dearborn, president of the Council, to AEC Chairman Lewis L. Strauss.

During 1952, the frequency of occupational injuries per million man-hours worked in all categories of the program decreased 50 percent below the average for the previous 3 years, and the severity of injuries was reduced 33 percent. The injury rate in the atomic energy program has declined steadily since the end of 1949. The frequency of injuries from accidents in the program dropped from 5.40 per million man-hours in 1949 to 2.51 in 1952. The injury rate for American industry decreased from 10.14 to 8.40 per million man-hours during the same period. The injury rate for employees of AEC operations contractors was 2.29 per million man-hours in 1952, compared with 3.02 for 1949–1951. The 1952 rate reported by the National Safety Council for the chemical industry, the nearest comparable industry, was 5.10.

Construction workers in the atomic energy program incurred 2.71 injuries per million man-hours during 1952—a 61 percent decrease below the 1949–1951 average. This

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improvement occurred despite an 80 percent increase in construction man-hours in 1952 over 1951. Direct employees of the Commission experienced 1.96 injuries per million man-hours in 1952, compared with 2.61 in 1949–1951. The rate for all Federal civilian employees for 1951, issued by the Bureau of Employees' Compensation, Department of Labor, was 8.4. Fatalities were reduced from the 1949–1951 average of 13 to 11 in 1952. None was due to radiation.

MONSANTO Chemical Company operations at Mound Laboratory, Miamisburg, Ohio, and at Trenton, Mich., today were announced as the winners of the company's President's Trophies for safety in 1953.

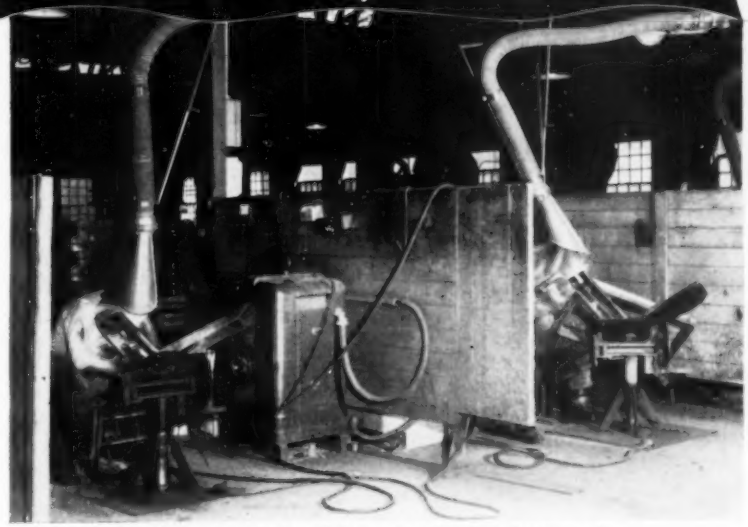
Final compilation of the overall company figures for the past year revealed a continuing safer trend, with an accident frequency rate of 1.30 as compared with 1.45 for 1952. This improvement has brought the frequency rate mark to the lowest in the company's history.

Mound Laboratory, operated by Monsanto for the Atomic Energy Commission, has a current record of 1,136 days without a major injury, for a total of 4,655,731 man-hours worked. In addition to winning the President's Trophy, the annual Group I Safety Improvement Award also has been won by Mound. In Group II of the company's plants, the winning record posted by the Trenton plant workers stood at 1,395 days without a major injury and a total of 3,022,035 man-hours worked as of December 31, 1953.

THE Howard Hughes Aircraft Plant in Culver City, Calif., has broken the nation's safety record for all industries associated with aircraft manufacture. There has been no lost-time accident at the plant for 6,472,798 man-hours.

Plant officials attributed the high degree of safety consciousness among all employees to a constant educational program and to 10 safety committees totaling 300 persons who are constantly alert to safety hazards.

RUEMELIN *Welding Fume Collectors*



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TRANSPORTATION SAFETY

Regional Seminars Held For Driving Instructors

SEMINARS for college driver-education instructors will be conducted at 6 regional centers during the coming spring and summer months, Dr. Herbert J. Stack, director of New York University's Center for Safety Education announces.

The safety sessions will be held in cooperation with the University of Texas from May 31 through June 5, the University of California from June 7 through 11, and the University of Illinois from June 14 through June 19. A seminar also will be conducted at NYU from June 21 through 25. In addition, during the week of March 1, college instructors in Mississippi will attend safety classes in Jackson; and a southern regional seminar will convene in Georgia at a time and place to be announced.

The seminars were made possible, Dr. Stack says, by the financial support of a leading insurance association. In previous years, more than 200 college instructors in all parts of the nation have been enrolled in similar courses conducted by the NYU Center for Safety Education.

Fleet Safety Courses

THE Institute of Public Safety at the Pennsylvania State University has announced the series of truck fleet safety courses and conferences to be held at various universities during 1954. The types of courses to be conducted and their scheduled locations are as follows:

Supervisor Courses: April 5–9, Univ. of Maryland; April 5–9, Univ. of Washington; April 19–23, Univ. of Florida; April 26–30, Univ. of Tennessee; April 26–30, Northeastern Univ.; June 7–11, Univ. of Denver; June 21–25, Northwestern Univ.; June 21–25, Univ. of Virginia; Sept. 20–24, Pennsylvania State Univ.; Sept. 20–24, Purdue Univ.; Oct. 11–15, Univ. of Michigan; Nov. 8–12, Univ. of Georgia.

Courses for Trainers of Commercial Drivers: May 3–7, Univ. of Wisconsin; May 24–28, Pennsylvania State Univ.; June 14–18, Iowa State College; Sept. 27–1, Univ. of Nebraska.

Terminal Operations Pertaining to Loss Prevention: May 12–14, Univ. of Georgia (Atlanta).

Top Management Course: May 8, Univ. of Minnesota; Sept. 28–29, Pennsylvania State Univ.

Two-Day Refresher Course: Oct. 5–6, Pennsylvania State Univ.

Maintenance Courses: April 19–23, Michigan State College; May 3–7, Pennsylvania State Univ.; Sept. 13–17, Univ. of Oklahoma (Tentative); Sept. 20–25, Univ. of Alabama (Tentative); Sept. 28–30, Univ. of Wisconsin; Oct. 11–15, Univ. of Tennessee (Tentative); Nov. 1–5, Oregon State College (Tentative); Nov. 8–12, Rutgers Univ.

Readers desiring further information concerning these courses should contact: Mr. Harry D. Fletcher, Central Extension Office, Institute of Public Safety, The Pennsylvania State University, State College, Pa.

Sight And Foresight Make Driving Safe

THE old adage "You can't hit what you can't see" has been reversed by J. T. Outlaw, Executive Vice-President of North Carolina Motor Carriers Association, Inc. Mr. Outlaw, in a statement issued as part of his association's program of advising the public on safe winter driving techniques, says, "You can hit what you can't see and that's why vision is important in driving."

He points out that winter driving vision is especially important because wet and icy roads make it imperative the driver see danger far in advance so that he can take action without danger of throwing his car out of control. Many drivers invite trouble by allowing their windshields to become caked with mud or ice and consequently their vision is so impaired that they don't see trouble in time to avoid it.

IF YOU MUST REPAIR YOUR CAR AT NIGHT, ON THE ROAD . . .

A COMBINATION red-flashing safety lantern and searchlight has been designed primarily for motorists. The lantern is designed to fill an important need. When trucks halt at the side of the road at night they are required by law to set out flares. The lantern serves a similar purpose for motorists, who are forced to stop at night and, at the same time, provides a powerful work lamp.

The two-in-one lantern has a pivot base for easy angle adjustment of both beams, a bail wire carrying handle and an additional grip handle. The glass top of the lantern body serves as a lens for the flashing and warning red light while the floodlight beam is directed forward, illuminating the work surface.

Both the warning flasher and the searchlight have independent switch controls which can also be operated simultaneously. Made by Olin Industries, Inc., the combination lantern is finished in red with gray trim. For details use Key # TS-1 on Inquiry Card on page 83.

That's Your Life You're Risking!

IT TAKES a deaf ear to walk away from safety in Chicago's busy Loop. That's because Chicago's safety-conscious police, believing the more you hear about safety the less likely you are to become an accident statistic, employ a special tape-recorder-loudspeaker equipped car to sharpen the city's safety sense.

Reduction of traffic death figures in Chicago during 1953, and a low traffic fatality count for the New Year's holiday has been credited in part to police use of the special car.

Driven by Officer John Hurkes, of the city's police safety education unit, the safety car cruises daily in the Loop's heavy traffic, beaming tape recorded "safety sense" messages to an estimated 200,000 to 350,000 pedestrians and motorists.

Equipped With Tape Recorder

Equipped with tape recorder, two loudspeakers, and a microphone hook-in for direct messages, the special car is a major part of Chicago's comprehensive police and civic safety education program.

The cruising white safety car was obtained through the efforts of the Citizens Traffic Safety Board, a nonprofit, civic organization, in October, 1952. It was a gift to the police department from the Metropolitan Ford Dealers of Chicago.

Here's how the car operates:

Officer Hurkes and other members of the special safety education unit regularly record on tape a series of "safety sense" messages. New messages are taped two or three times a month with special attention given traffic hazards of holidays.

The messages are played back by the recorder as the car cruises daily in traffic, or parks at busy intersections. Special microphone equipment enables the officer to break in with messages directed at individuals or groups he sees violating basic safety rules.

The car's two loudspeakers enable messages to be heard clearly a full block away in both directions above the noise of traffic.

More than 125, short, slogan-type messages are flashed each hour by the hour-length, 600 foot tape which is rewound and played over and over again during the course of the day.

Typical messages warn motorists to yield right of way to pedestrians, observe various traffic regulations, and drive only when sober. Pedestrians in turn are alerted to the dangers of crossing in the middle of the block, dashing out from between parked cars, and refusing to wait for pedestrian crossing signals.

Spotting a group of women shoppers rushing across a busy street in midblock, Officer Hurkes cuts in with his own direct, polite-but-firm message, urging: "Ladies—please turn back and cross at the corner. Death is eternal but you wait only 30 seconds for the green light. Stop, look, and live!" The shoppers generally pause, then soberly turn back to the curb.

The message, given direct or delivered by tape, strikes at the heart of the Loop's greatest single traffic

hazard—careless pedestrians rushing across the busy streets in midblock.

The officer avoids embarrassing pedestrians or motorists, except on occasions when instant action can avoid an accident. Sometimes he has to seize the microphone to stop a pedestrian about to step out from between parked cars into the path of oncoming traffic.

Is it effective? All the proof needed is in the expressions on the faces of the safety violators—and the drop in accident statistics.

Pictures by courtesy of Ampro Corp.

Highway Death Toll

EXCESSIVE speed by drivers with "a superman complex" was termed the greatest misuse of the modern power-packed automobile by Paul H. Blaisdell, public safety director of an insurance organization in a talk before the Burlington (N. J.) Safety Council.

16 a Week Die

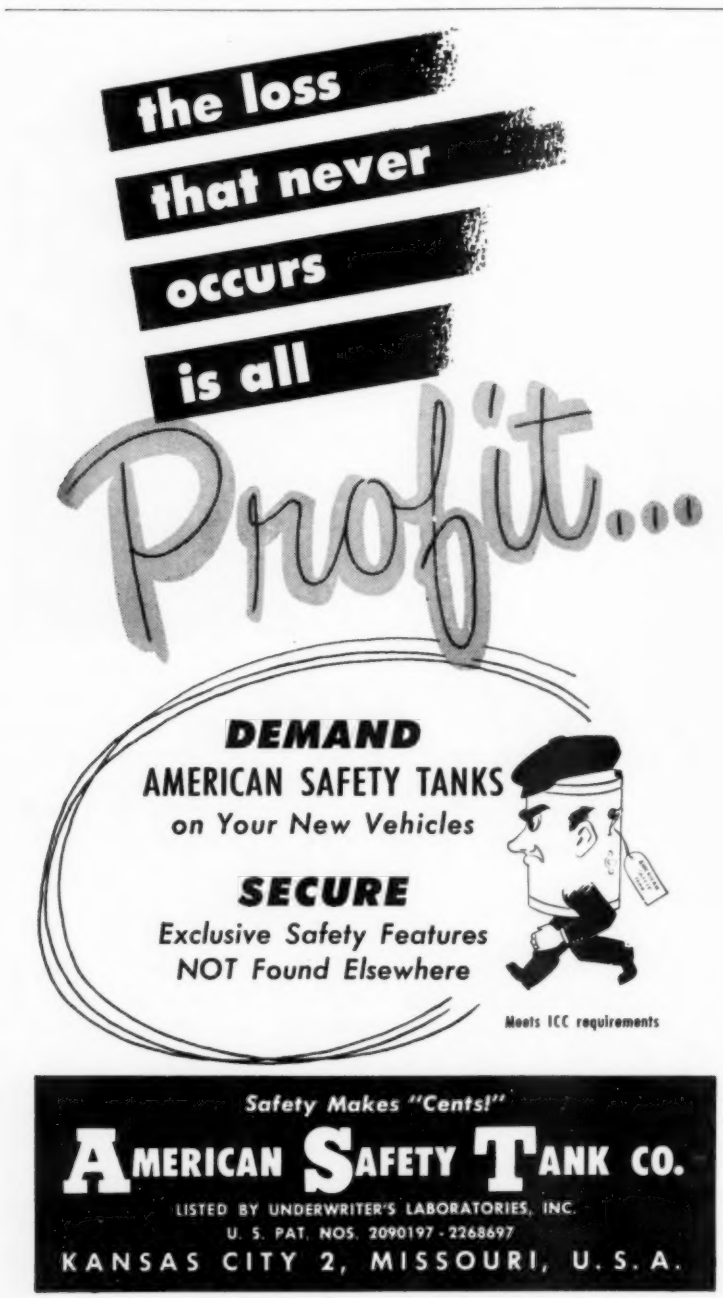
Attacking the "statistical hokum" about the toll of traffic accidents which he said fails to reflect the complete picture of increasing deaths, injuries and property damage in highway crashes, Mr. Blaisdell also listed as "the worst pitfalls" of safety efforts the drunken driver, inadequate control of drivers through strong licensing measures and wider use of suspension of the driving privilege as a penalty, and weak enforcement of traffic laws by state, county and local police.

In New Jersey, Mr. Blaisdell declared, the traffic toll has reached a rate of about 16 deaths a week, nearly five personal injuries an hour, and one property damage accident every three minutes. The 1952 toll of 837 deaths, 38,203 personal injuries and 138,325 property damage accidents represented, he said, a bill of $65.76 for every New Jersey family of four. The state's 1952 accidents ran to a grand total of $79,515,000 in economic losses.

Stronger Enforcement

Mr. Blaisdell declared a specific point of attack, such as traffic law enforcement by the police and the courts, coupled with more and longer periods of suspension and revocation of the driver license for flagrant lawbeaters, "will do more to cut down death and injury on our highways than any other project we might devise."

"We encounter the usual number of individuals and organizations who believe that we must still coddle drivers and not be too strict with them lest we inconvenience their economic balance or invade their personal liberties," he added. "The personal liberty concept of driver licensing and the unvarying retention of the license once it is given should be as extinct as running boards and squeeze bulb horns."



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SEE NEXT PAGE

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(pages 2 and 3)

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INDUSTRIAL NOISE SURVEY

(Use Key # 955 on Inquiry Card on page 83)

A SERVICE which includes industrial noise surveys, audiometric surveys, noise level determinations, and octave band analyses of noises is offered by the Emmet Technical Associates. An evaluation is made of the effect of noise on workers in industry, and recommendations are offered for control and where necessary for changes in design to guard against deafness, nerve injury, and accidents arising out of employment in excessively noisy areas.

NEW LIGHTWEIGHT GOGGLE

(Use Key # 956 on Inquiry Card on page 83)

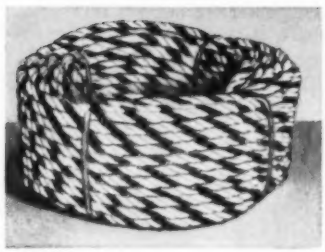
A NEW lightweight low-cost safety goggle, suitable for semi-hazardous operations such as spot welding, buffing, woodworking, inspection, and hand tool operation, is announced by the Welsh Mfg. Co. Called Welsh-Guard, they are also recommended for the protection of prescription goggles and use by plant visitors.

The goggle has an acetate frame with full-vision spatula temples and the lens, which is non-replaceable, may be either clear or green. Since no metal touches the skin, the goggle is said to be very comfortable.

PLASTIC ROPE

(Use Key # 957 on Inquiry Card on page 83)

INDUSTRIAL Products Company announces a new Plastic Barrier Rope. Made of triple strands of polyethylene plastic, two yellow and one black, the rope has high visibility and effectiveness in that



it carries out the standard "CAUTION" colors and immediately identifies a restricted area.

Called POLY-ROPE, it is $\frac{5}{16}$" diameter, has excellent dielectric properties, and is light and flexible. In addition, it will not support combustion or absorb dirt, and is unaffected by oil.

Suitable for use in making up barricades around electrical equipment, plant maintenance work, roping off test areas, building projects, etc., and in chemical plants where acids and other corrosive chemicals cause the rapid deterioration of fiber rope.

CONDUCTIVE WAX

(Use Key # 958 on Inquiry Card on page 83)

A NEW conductive wax that is said to eliminate the dangers of dust or vapor explosions resulting from static electricity is announced by The Gerson-Stewart Corporation.

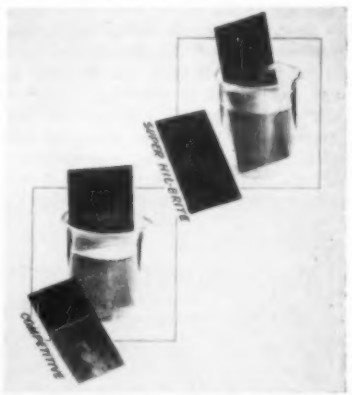
Known as Swiftsheen Conductive, this wax was developed for use in danger areas of hospitals, ordnance plants, arsenals, laboratories and industry. The new wax will neither darken nor stain floor surfaces. Tests prove that it meets government safety requirements for a conductive non-sparking flooring surface. The manufacturer states that this new water-emulsion conductive wax is identical in appearance and performance to the company's regular floor wax. Easily applied, it is said to be bright drying and non-slippery. One application, if properly maintained, should last months under normal traffic conditions.

WATER-RESISTANT WAX

(Use Key # 959 on Inquiry Card on page 83)

HILLYARD Chemical Company has announced the results of new water-resistance laboratory tests on their trademarked product, Super Hil-Brite wax.

The findings are of interest to all maintenance men troubled with milky residue after damp mopping—"tracked in" moisture in schools, hospitals, offices, lobbies, reception rooms—"water spotting" under food preparation and serving, or other operations subject to spillage. Results proved that for immediate use, the new wax showed a remarkable water-resistance after only the first hour of drying.



With longer drying periods, water resistance of the wax increased—until, after overnight drying, the wax did not turn white or milky even after 12 hours in a watery bath. Inferior waxes set up a definite milky appearance proving great susceptibility to wash off damage. Conclusive findings were: no discoloration of the new wax, imperviousness under many hours submersion in water, even after only 1 hour of drying time. The wax showed no wash-off loss of surface, did not lose gloss. Inferior waxes tested failed in one or more respects at varied stages of the testing.

The exceptional water-resistant features of the new wax were developed without shellac, varnish gums, or other resinous materials (so harmful to proper maintenance), the manufacturer reports.

ELECTRIC DRYER ATTACHMENT

(Use Key # 960 on Inquiry Card on page 83)

A NEW accessory for the Sani-Dri electric boot dryer, manufactured by The Chicago Hardware Foundry Co. has been developed for drying gloves quickly. Consisting of a set of two forms in the shape of hands, the glove holders are easily attached to the air stream tubes which are ordinarily used for drying boots.

The twin streams of warm air dry the gloves quickly without danger of burning or damage to the gloves because of excessive heat. Numerous industries and institutions will find this attachment to be of considerable benefit, particularly because gloves can be put back in service much quicker than by ordinary methods. Factories, food processors, chemical companies, laboratories, drug manufacturers, hospitals, and many others have a definite need for efficient glove drying equipment.

NEW ALKYD-TYPE PAINT

(Use Key # 961 on Inquiry Card on page 83)

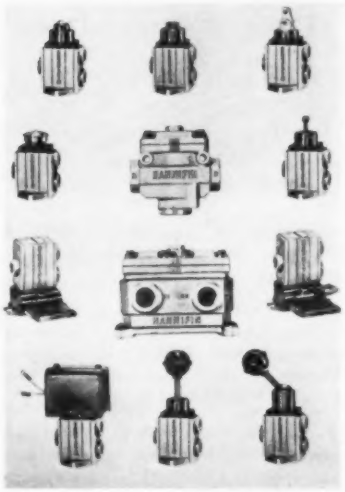
TO MEET the demand for a flat finish possessing greatly improved performance characteristics, Pittsburgh Plate Glass Company has announced the development of an alkyd-type flat wall paint possessing qualities of durability, washability, mar resistance, uniformity of appearance, and ease of application. The product was made possible by employing the alkyd resin type vehicles usually associated with enamels.

Known as Wallhide PBX Flat Wall Paint, this paint covers evenly in one coat over previously painted surfaces. No primer is required because it is self-sealing. It is easily applied by brush or roller coater, dries rapidly, and has no painty odor. The finish is so tough that it can be washed or scrubbed repeatedly without marring it or fading its color. The nonporous paint film provides a protective seal against soot, dirt, grease, and stains. Available in a wide range of colors.

NEW PILOT VALVE SERIES

(Use Key # 962 on Inquiry Card on page 83)

AN ASSORTMENT of ten Pilot Valves is announced by Hannifin Corporation in their new P-M line of "Pilot-Master" valves. The valves can be used either 2-way or 3-way, normally closed to pressure or normally open to pressure. Designated as Series C, and normally furnished only in ¼" I.P.S., they can be used either for the direct control of small air cylinders and other air-operated devices or for the remote control of larger units when installed to control either of the new P-M Master Valves, the Series B-1 (3-way) or the Series BB-1 (4-way). One Pilot Valve can be installed to operate two or more Master Valves or, in more complicated all-pneumatic circuits where cam-operated Pilot Valves operate like limit switches, there may be several Pilot Valves operating one Master Valve.



Basically the same 3-way, direct-operated, poppet-type valve mechanism is used in all ten Pilot Valves, and the choice of operating heads ranges from the solenoid head, the ball-type, cam-operated head, and the palm button head to a piston-type, pressure-operated head. There are hand toggle models, both locking and non-locking, and foot-operated models, also locking and non-locking. An "over-riding cam" model operates only when contacted from one direction; the cam roller "falls free" when contacted from the opposite direction. There is also a mechanical toggle model which can be operated from any direction when its operating lever is made part of a mechanical linkage. Made of oil and corrosion resistant parts throughout, a single, lightly stressed stainless steel return spring and internal friction is all the operator has to overcome. These valves can also be used without modification in vacuum service, and because their internal passages are all full ¼" I.P.S. or larger, they can with advantage be ordered drilled and tapped for ⅜" I.P.S. connections where larger pipe or tubing runs are desirable. Most models can also be supplied, on special order, for panel mounting.

TOGGLE FUSE PULLER

(Use Key # 963 on Inquiry Card on page 83)

AN INGENIOUS toggle fuse puller, moulded of shatterproof plastic, is announced by Star Fuse Co., Inc. The new safety product for electricians, maintenance men, and homeowners is assembled from 4 moulded parts of transparent amber plastic. These are hinged together in a powerful toggle design which gives a non-slip grip for removing or replacing fuses. One end of the tool handles fuses up to 30 amperes—the other, fuses from 31 to 100 amperes.

Laboratory tests indicate that the new fuse puller has double the strength of fiber fuse pullers, and is capable of withstanding over 4,000 volts breakdown after 24 hours immersion in salt water. Light as well as tough, the tool weighs only 2 ounces. The characteristic pleasant feel of the type of plastic keeps it comfortable to use.

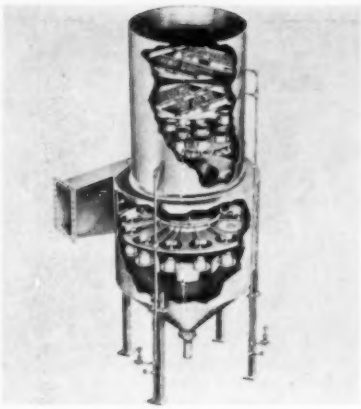
VENTILATED WELDING HELMET

(Use Key # 964 on Inquiry Card on page 83)

BOTH safety and comfort are provided for welders by a new seamless plastic welding helmet announced by the General Electric Company's Welding Department. Lightweight and strong, the new helmet incorporates a ventilation design for cooler welding and prevention of lens fogging. The plastic shell is heat-resistant, moisture-proof, and non-warping, according to the company.

The headgear is designed to fit the contour of any head. Wider range headsize adjustment is provided by a ratchet-type device and a four-position stop meets vertical and overhead needs.

The helmet is available in a durable black finish with or without a flip-front. Respective weights of the two models are 29 and 25 ounces.



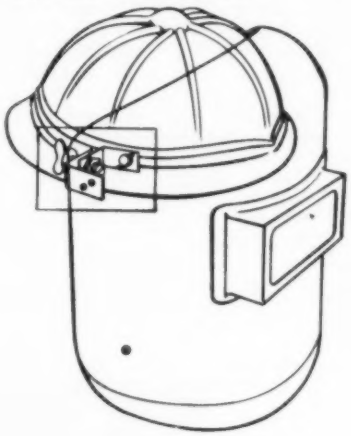
STACK DUST CONTROL

(Use Key # 965 on Inquiry Card on page 83)

A NEW system for controlling stack dust has been produced by the Johnson-March Corp., with an unusually wide range of applications and design flexibility. The system, combining 6 different principles of dust precipitation, is capable of removing extremely large volumes of dust from the stack gas. Its operating efficiency, even at the extremely high dust loadings found in asphalt plants, assures freedom from air pollution and the end of dust nuisance, the manufacturer reports. The unit is especially adapted to the control of dust from rotary dryers, cyclones, kilns, roasters, mixers and pulverizer exhausts; and from the stacks of asphalt plants, chemical plants, and similar industrial operations.

Much less water is required than in ordinary scrubbers and the entire assembly is compact and easily moved. Connections are made conveniently to existing duct work. The device is known as the Johnson-March Liquid Precipitator Multiple-Action Scrubber. This scrubber is built for capacities from 1,500 cfm to 48,000 cfm. The units range in physical size from 14'10" high to 32'10" high. All dust removed from the air is reduced to a watery sludge which can be discharged into a tank or pond for easy removal of the solids. A recirculation system can be used. The scrubbers are constructed of ¼" steel plate electrically welded and equipped with hinged inspection doors properly gasketed. Each unit is built in two or more sections for ease in handling and dismantling for removal to new locations. Suitable linings of corrosion resistant metal can be installed.

Centrifugal separation of the larger dust particles and pre-cooling of the gases begins where the dust laden air enters the scrubber. Directional control and velocity control of the gases are accomplished by multiple scrubber throats. The large mass of gas is divided into many smaller volumes for better scrubbing action. At the same time, the velocity of the gas is accelerated so that the entrained solids impact upon impinger plates. A high velocity water jet also wets the plate and breaks up the water into small droplets for efficient scrubbing of the solids from the gas stream. Expansion of gases in a lower expansion chamber discharges the bulk of the solids in the form of a slurry at the lower drainage outlet. Then inertial separation occurs through reversal of the gas flow upward through the center stack. Part of the wetted solids are removed in the process. From this stack, the gases enter another expansion chamber to reduce velocities once more. Again the gases pass through multiple scrubbing stages to insure maximum removal of the smaller particles. These gases pass through a second series of scrubber throats to impingement plates, and move into still another expansion chamber, thus repeating the principles outlined above. This repeated expansion and contraction is of primary importance for complete precipitation. Additional scrubbing stages can be provided for further precipitation of sub-micron sizes. The final cleansing of the stack gases is accomplished by means of the precipitator elements. The application of special compound in this phase assures final removal of low micron particle sizes and entrained mist. From this point the cleansed gases are discharged into the atmosphere.



SPRING-LOCK HELMET FASTENER

(Use Key # 966 on Inquiry Card on page 83)

A NOTHER important contribution to the safety and convenience of construction workers and welders is announced by the Davis Emergency Equipment Company.

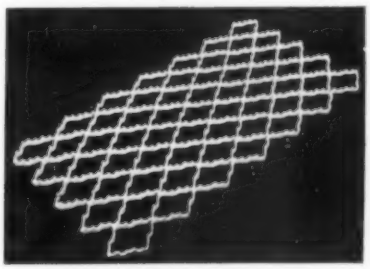
A new device, developed by Davis engineers to improve the safety and functional convenience of the company's safety helmets and welding masks, permits quick attachment and separation of helmet and mask without removing the helmet from the head. The device consists of a simple, foolproof spring lock fastener. A metal post on each side of the mask "plugs" into a lug fastened to each side of the helmet. A twist secures it in place, and a reverse twist disengages it equally easily. It cannot come unfastened accidentally. When continuous head protection is important, but the mask unnecessary, the worker need only twist the spring locks on both sides of the mask and remove it, keeping the helmet in place. The device may also be used with helmets and masks other than those made by the company.

NON-FLAMMABLE CLEANER

(Use Key # 967 on Inquiry Card on page 83)

A NEW dry cleaner and spot remover called PRO-FESH has been announced by Pro-Fesh, Inc. Developed originally for cleaning of rugs and used by professional dry cleaning establishments, PRO-FESH utilizes a new, ultra-modern spray method of application. It is dispensed from a push-button metal container, and forms a fine, pressurized mist, leaving no "rings" when applied to any of the more than 100 articles it can clean. Does not contain carbon tetrachloride to achieve non-flammability.

PRO-FESH works on many types of fabrics and to clean wallpaper, painted surfaces, typewriters, fans and electric motors. Common stains such as beer, candy, egg, lipstick, gravy, grease, mustard, paint, shoe polish, wax and others can be quickly removed. No harsh rubbing is necessary, just a gentle wiping or sponging with a dry, clean cloth. A blend of chlorinated and petroleum solvents, the cleaner and spot remover has been tested and approved by the New York City Fire Dept.



NON SKID GRATING

(Use Key # 968 on Inquiry Card on page 83)

THE Bustin Firm-Grip Grating Corp. announces the introduction of a new product, "Coroweld" Non Skid Grilles. Light in weight, this product is adaptable to the assembly of platforms, catwalks, stair treads, etc., and for slippery floor areas and steep inclines. The unique assembly and engineered spacing of the contact points assure safe walking and firm footing in grease, oil, snow, sleet, etc. Bustin Coroweld Non Skid Grilles are available in various sizes for installation on skidding and slipping spots.

GASOLINE FILLER CAN

(Use Key # 969 on Inquiry Card on page 83)

THE Eagle Manufacturing Co. has announced a new all-purpose utility gasoline filler. Called the Eagle 2½-A, the new can holds 2½ gallons of gasoline, and is made of 26-gauge galvanized sheets. Its dome-shaped body is seamless with strong double-seamed leakproof bottom. Another feature is a seamless drawn stationary spout with "Duo-Pour" spout cap enabling the user to adjust for pouring rapidly into large receptacles or more slowly into small containers.

The can also has a 7½-inch flexible spout equipped with brass strainer which can be attached to the smaller opening in the "Duo-Pour" cap for use in filling tanks on outboards, power lawn mowers or other gasoline-powered equipment—eliminating use of a funnel. Additional standard equipment includes a graduated oil measure of ¼-, ⅓- and ½-pint capacities, and a vent in the filler cap to permit easy flow of gasoline when pouring.

PORTABLE DUST BIN

(Use Key # 970 on Inquiry Card on page 83)

TORIT Manufacturing Company has placed on the market a portable dust bin as optional equipment for its Model 219 Twin Cyclone Dust Separator. It is intended for use where large volumes of dust require frequent emptying of the dust reservoir for disposal or salvage.

Use of this portable dust bin requires that the Model 219 unit be mounted on legs and equipped with a hopper bottom. From this hopper a 12-inch diameter air-tight flexible sleeve leads to a specially designed lid that fits onto the bin with quick acting clamps. According to the manufacturers this portable dust bin materially reduces the down time required to change dust bins. All that is necessary is to loosen the four clamps, raise the lid lever and roll out the bin. Because of its capacity—8 cubic feet—the bin is mounted on rubber-tired casters.

NEW WELDING GOGGLE

(Use Key # 971 on Inquiry Card on page 83)

A NEW Model 492 SV "Stac-Vent" Goggle for welding has been developed by the Watchemoket Optical Co. "Stac-Vent," a new principle of goggle ventilation, prevents fogging and provides draft ventilation at the top and center of the goggle where warm, moist air normally accumulates. Large openings for ventilation are safely shielded by the hood. The opaque black soft vinyl plastic frame, large enough to fit over all prescription glasses, comfortably form-fits the contours of the face and nose, leaving no gaps. A heavy, opaque lens holder has lens pockets for replaceable 50 mm round, Federal Specification, glass filter lenses, protected both inside and outside by hard plastic cover lenses. The inside cover lens eliminates the danger of glass splinters reaching the eye, if impact should break the filter lens. Outside cover lens is easily replaced without removing filter lens or inside cover lens. Goggles can be furnished with filter lenses in shades No. 3, 4, 5 or 6.

Three other models of the "Stac-Vent" Goggle are available for stand-by protection in welding areas. Model 490 SV has a black opaque frame with a large, one-piece, shatterproof optically correct Methacrylate lens. This lens is replaceable in medium green (absorbing 35% of infra-red rays) or dark green (absorbing 43% of infra-red rays). Both of these provide protection in arc welding areas and both provide full protection from heavy impact and other hazards. Model 440 SV with "Stac-Vent" has a transparent soft vinyl frame with .125" thick replaceable clear Methacrylate lens for heavy impact protection.

Model 442 SV with "Stac-Vent" has a transparent soft vinyl frame with a transparent lens holder for 50 mm round, hardened safety glass lenses protected with an acetate inside cover lens to prevent shattered glass from penetrating the eyes in case of impact. All four models have interchangeable parts.

PLASTIC LABEL TAPE

(Use Key # 972 on Inquiry Card on page 83)

NEW plastic Labelon "Write on it" Tape sticks without moistening to any clean, smooth surface. All necessary information regarding circuits, including number or service, voltage, amperage, phase, AC or DC, can be noted on a strip of the new tape and applied anywhere on circuit boxes or boards. Since the tape strips off cleanly and can be applied and re-applied an almost unlimited number of times without losing its adhesive quality, changes can be made quickly and easily.

The writing on the tape will not smudge. No pencil lead, ink or crayon is required. The pressure of the writing instrument alone brings out the writing —*any* dry, blunt point can be used such as an ordinary lead pencil or stenciling stylus.

Despite the ease with which the new tape can be written on, applied and re-applied, it provides a practically permanent label under even abnormal conditions, resisting aging and sunlight as well as heat and cold from —40° F to +150° F. It can be used to label not only electrical circuits but hundreds of items in factory, office or home.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Protective Equipment 343
Safety Clothing & Equipment Co. An unusually complete line of clothing and products for protecting industrial workers is shown in this 86-page catalog. Well illustrated, it includes all types of protective clothing and also first aid supplies, safety cans, guards, extinguishers, signs, and hundreds of other safety items.

Plastic Work Hat 344
Mine Safety Appliances Co. Brochure describes plastic work hat designed for linemen and electrical construction workers. Hat is diagrammed and specifications are given. Various accessories for particular uses also listed.

Welding Gloves 345
Universal Leather Co. Line of welders' hand protection pictured in brochure with descriotion of each. Includes leather and asbestos gloves, mittens, one finger mittens, hand pads, as well as some aprons and spats.

Linemen's Rain Suits 346
John E. Dorsey Co. Each component of complete waterproof rain suit for outdoor workers is diagrammed and described. Suits composed of jacket, pants, and hood; several types of boots are also shown.

BUILDING MAINTENANCE

Ladders & Scaffolds 347
Patent Scaffolding Co., Inc. 23 pages of ladders, scaffolds and safety accessories. Complete specifications for each product including Underwriter's Laboratories approval where appropriate. Care and use of ladders is explained.

Vacuum Cleaning Systems 348
U. S. Hoffman Machinery Corp. Problem of industrial dust analyzed and line of vacuum cleaning equipment described in 12-page pamphlet. List included of points to consider in planning vacuum cleaning system.

Cleaning Compound 349
G. H. Packwood Mfg. Co. Varied uses of cleaning compound is subject of this bulletin. Low alkalinity and non-streaking qualities make it suitable for many maintenance needs; such as cleaning floors, walls, woodwork, windows, painted surfaces, etc.

MEDICAL

Resuscitators 350
J. H. Emerson Co. Pamphlet gives complete diagram of resuscitator, directions on how to use it, and instructions on when to use what type of resuscitation equipment. Has pictures and description of manual artificial respiration, and a series of questions and answers designed to give complete information on problems that arise when using resuscitators.

First Aid Kits 351
Pac-Kit Co. Wide variety of first aid kits for general and specific uses covered in this brochure. Kits for aircraft, buses, individuals, and small groups are described. Diagrams show how to use various medications and bandages.

Waterless Cleaner 352
Great Stuff Products Co. Bulletin describes waterless hand cleaner for factory, office, and home use to protect the skin and help prevent it from becoming dry and chapped. Ability to dissolve paint, tar, ink, grease, etc., noted.

FIRE PROTECTION

Vacuum Hand Pump 353
Tokheim Oil Tank & Pump Co. Application of vacuum hand pumps to transferring liquids on many different types of jobs is discussed in this brochure. Cross-sectional diagram of pump with important features explained.

Foam Fire Protection 354
National Foam System, Inc. A question-and-answer pamphlet of 16 pages covering mechanical and chemical foam products and devices. Also describes service offered. Most products and devices are approved by Underwriter's Laboratories or Factory Mutual Laboratories.

Sprinkler System 355
Blaw-Knox Co., Automatic Sprinkler Dept. Sprinkler systems and their relation to industrial safety and production are outlined and discussed in this 8-page booklet. Includes diagram of a complete sprinkler system. The company's engineering service for water and other type automatic and manual systems is also discussed.

MATERIALS HANDLING

Metal Wire Products 356
Cambridge Wire Cloth Co. This brochure provides information about woven wire conveyor belts, woven wire slings, industrial wire cloth, and special metal fabrications such as, screens, filter leaves, baskets, crates, trays, etc.

Handling System 357
Factory Service Co. A means of handling materials in many plant operations with interchangeable and interlocking units is completely covered in this 28-page catalog. Has recomendations for uses of various units and shows applications. Profusely illustrated.

Winch-Hoists 358
Lug-All Co. Bulletin lists data on portable winch-hoist. Specifications given and basic applications pictured. Line of accessories to meet specific needs also included.

ELECTRICAL EQUIPMENT

Emergency Lighting Unit 359
Electric Storage Battery Co. Selection of emergency lighting equipment subject of pamphlet. Features of unit shown with schematics, layouts, and illustrations of typical installations. Contains specifications conforming with National Electric Code for 6-volt emergency lighting equipment.

Magnetic Contactors 360
Federal Electric Products Co. Complete information on magnetic contactors in connection with circuits controlling sequence of operations in multiple action machines. Dimensions and weights given. Underwriter's Laboratories approved.

(Continued on next page)

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Free Bulletins (Cont'd)

MISCELLANEOUS

Safety Posters 361
Alfred M. Best Company, Inc. Bulletin discusses the use of safety posters in cartoon style to attract the worker's eye and acquaint him with safety practices. Several sample posters are shown.

Changeable Letter Signs 362
Wagner Sign Service, Inc. Catalog of bulletins illustrating and listing specifications for various types of changeable copy signs. Includes information on types of letters, word units, background assemblies and mounting equipment.

Magnetic Shield 363
Standard Portable Cord Co. Use of magnetic plastic shields attached to machinery for protection of operators shown in bulletin. Shield does not obstruct worker's vision but protects from flying particles. Has swivel for universal positioning.

Testing & Guidance 364
Science Research Associates. 77-page catalog of testing and guidance equipment for determining qualifications of personnel. Includes tests for general aptitudes and learning levels as well as specific tests in various vocational fields.

Freight Car Tools 365
Safety First Supply Co. Bulletin describes and illustrates the use of a friction wrench for dumping and winding up pockets of hopper car doors, and a rail clamp for holding car wheels in place.

Torches & Furnaces 366
Insto-Gas Corp. Line of tools for soldering and melting metals pictured in bulletin. Includes cylinders, flame torches, blow torches, furnaces, and accessories. Listed by Underwriters and Factory Mutual Laboratories.

Cutting Tools 367
Manco Mfg. Co. Illustrated bulletin with specifications ranging from light-weight hand cutters to high capacity bolt cutters. For cutting steel rods, wire, fence, steel strapping, high tension wire, etc.

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427½ Moreland Avenue, N. E.

BIRMINGHAM, ALA.
Guardian Safety Equipment Co.
4215 1st Ave. No.

BOSTON, MASS.
General Equipment Corporation
261 Franklin Street

BUFFALO, N. Y.
The Watson Company
1443 Main Street

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Universal Safety Equipment Co.
5115 Diversey

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Williams & Co., Inc.
3231 Fredonia Avenue

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Williams & Co., Inc.
3700 Perkins Avenue

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Williams & Co., Inc.
851 Williams Avenue

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Guardian Safety Equipment Co.
900 Jefferson Tower Bldg.

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Averill Equipment Company
19225 Conant Avenue

EAST ORANGE, N. J.
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491 Prospect Street

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Fire Appliance & Safety Co.
1114 W. Markham

LOS ANGELES, CALIF.
Guardian Safety Equipment Co.
7223 S. Main Street

LOUISVILLE, KENTUCKY
Williams & Co., Inc.
1109 S. Preston Street

MILWAUKEE, WIS.
Universal Safety Equipment Co.
3155 S. 7th Street

PEORIA, ILL.
Universal Safety Equipment Co.
116 S. Garfield

PHILADELPHIA, PA.
Guardian Safety Equipment Co.
214 S. 45th Street

PITTSBURGH, PA.
Williams & Co., Inc.
901 Pennsylvania Avenue

ST. LOUIS, MO.
Safety, Inc.
2608 Olive Street

ST. PAUL, MINN.
Continental Safety Equipment, Inc.
1551 Selby Ave.

SALT LAKE CITY, UTAH
Universal Fire & Safety
Equipment Co., Box 1587

SAN FRANCISCO, CALIF.
Guardian Safety Equipment Co.
50 Hawthorne Street

SPOKANE, WASH.
Spokane Safety Appliances
W. 314 Pacific Ave.

TOLEDO, OHIO
Williams & Co., Inc.
650 E. Woodruff Avenue

TULSA, OKLA.
Guardian Safety Equipment Co.
1742 S. Main Street

WICHITA, KANS.
Guardian Safety Equipment Co.
723 S. Broadway

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